SUPERIOR COURT OF CALIFORNIA

IN AND FOR THE CITY AND COUNTY OF SAN FRANCISCO

LESLIE J. WHITELEY and)
LEONARD WHITELEY,)
)
Plaintiffs,)
)
vs.) Case No.
) 303184
RAYBESTOS-MANHATTAN, INC., et al.,)
)
Defendants.)
_____)

DEPOSITION OF WILLIAM A. FARONE, Ph.D.

Santa Ana, California

Tuesday, December 21, 1999

Reported by:

Corin M. Mulrenin,
CSR No. 9496

Job No.:
URL4284

SUPERIOR COURT OF CALIFORNIA

IN AND FOR THE CITY AND COUNTY OF SAN FRANCISCO

LESLIE J. WHITELEY and)

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Courtesy of the Tobacco Industry Documents Library at UCSF http://tobaccodocuments.ucsf.edu/docs/jjxd0001

LEONARD WHITELEY,)
)
Plaintiffs,)
)
vs.) Case No.
) 303184
RAYBESTOS-MANHATTAN, INC., et al.,)
)
Defendants.)
_____)

DEPOSITION OF WILLIAM A. FARONE, Ph.D.,

taken on behalf of the Defendants, at

207 West 20th Street, Santa Ana, California,

commencing at 10:20 a.m., on Tuesday,

December 21, 1999, reported by CORIN M.

MULRENIN, CSR No. 9496, a Certified

Shorthand Reporter for the State of

California, pursuant to Notice.

APPEARANCES:

For the Plaintiffs: WARTNIK, CHABER, HAROWITZ,
SMITH & TIGERMAN
Attorneys at Law
BY: ROBERT BROWN
- and -
MADELYN J. CHABER
101 California Street
Suite 2200
San Francisco, California
94111-5802

For the Defendant Philip Morris Incorporated: WINSTON & STRAWN
Attorneys at Law
BY: GEORGE C. LOMBARDI
- and -
EDWARD G. ZAKNOEN
35 West Wacker Drive
Chicago, Illinois 60601-9703

For the Defendant Philip Morris: SHOOK, HARDY & BACON
Attorneys at Law

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Digitized by the Legacy Industry Documents Library - http://industrydocuments.ucsf.edu/docs/jjxd0001

Incorporated:	BY: LUCY E. MASON One Market Steuart Tower, Ninth Floor San Francisco, California 94105-1310
For the Defendant R.J. Reynolds Tobacco Company:	WOMBLE, CARLYLE, SANDRIDGE & RICE Attorneys at Law BY: JEFFREY L. FURR - and - CHRISTOPHER A. KREINER 200 West Second Street Post Office Drawer 84 Winston-Salem, North Carolina 27102

I N D E X

EXAMINATION BY:	PAGE
Mr. Lombardi	7
Mr. Furr	224

FURTHER EXAMINATION BY:	PAGE
Mr. Lombardi	283

E X H I B I T S

DEFENDANTS':	PAGE
1 - Document entitled "Philip Morris Incorporated's Re-Notice of Taking Deposition of William Farone, Ph.D. and Request for Production of Documents (New Date, Time and Location)"	8
2 - Document entitled "Objections to Philip Morris Incorporated Request for Documents Set Forth on Exhibit A on their Notice for the Taking of the Deposition of William Farone, Ph.D."	8
3 - Article entitled "Reaction Mechanisms in the Burning Cigarette," by Thomas S. Osdene, the first page of which is	85

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Digitized by the Legacy Industry Documents Library - http://industrydocuments.ucsf.edu/docs/jjxd0001

entitled "Contents"

4 - Article entitled "Studies of Cigarette Smoke Transfer Using Radioisotopically Labelled Tobacco Constituents," by T.H. Houseman 96

5 - Article entitled "GC-AED Studies of Nicotine Fate in a Burning Cigarette," by Nanette A. Stevens and Michael F. Borgerding 110

0005

E X H I B I T S (Continued)

DEFENDANTS': PAGE

6 - Article entitled "The Use of Carbon-14 Labelled Compounds in Smoke Precursor Studies--A Review," by Robert W. Jenkins, Jr., R.A. Comes, and R.T. Bass 118

7 - Article entitled "The Quantitative Recovery of Smoke from Radioactively Labeled Cigarettes," by R.W. Jenkins, Jr., M.K. Chavis, R.H. Newman, and F.A. Morrell, 121

8 - Document entitled "Level 1 - 44 of 94 Patents, 4,607,646, Aug. 26, 1986, Process for modifying the smoke flavor characteristics of tobacco" 123

9 - Document entitled "Expert Witness Disclosure of William A. Farone, Ph.D., Re: "John J. Neri, et al., v. R.J. Reynolds Tobacco Company" 225

10 - Document entitled "Safer Cigarettes" 226

11 - RJR Inter-Office Memorandum dated July 7, 1988, subject: Nicotine Levulinate 308

12 - Document entitled "Tobacco Additives" 308

13 - Letter dated April 17, 1996 to R.J. Reynolds Tobacco Co., from W.S. Rickert, Ph.D 308

14 - Document entitled "Levulinic Acid," prepared by Dr. Scott Appleton, R.J. Reynolds Tobacco Company, dated February 21, 1986 308

15 - Document entitled "Rebuttal of Testimony of David E. Townsend, Ph.D." dated October 26, 1999 308

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Courtesy of the Legacy Tobacco Documents Library (LTDL) http://industrydocuments.ucsf.edu/docs/jjxd0001

E X H I B I T S (Continued)

DEFENDANTS':	PAGE
16 - Declaration of David E. Townsend, Ph.D., dated September 15, 1999, with attached documents	308
17 - Document entitled "FTC has a Beef with 'No Bull' Ads, Cigarette Maker to Add Health Disclaimer for 'No Additives' Winstons," by John Schwartz	308

Santa Ana, California, Tuesday, December 21, 1999
10:20 a.m.

WILLIAM A. FARONE, Ph.D.,
produced as a witness by and on behalf of the Defendants, and having been first duly sworn, was examined and testified as follows:

http://legacy.library.ucsf.edu/tid/otn05a00/pdf
Digitized by the Legacy Industry Documents Library - http://industrydocuments.ucsf.edu/docs/jjxd0001

EXAMINATION

BY MR. LOMBARDI:

Q Would you state your name for the record, please?

A My name is William Anthony Farone.

Q Dr. Farone, at this point you have been deposed numerous times; is that correct?

A That is correct.

Q And you are familiar with the procedure, I take it?

A I am.

Q And so if you don't understand a question, will you tell me so I can reformulate it in an understandable form?

A I will.

Q And you will try to wait to answer the question until I've completed it so that the

0008

reporter can make a clear record?

A Yes.

MR. LOMBARDI: Let's mark the Notice of Deposition.

(Defendants' Exhibit 1 was marked for identification, the original of which is attached hereto.)

MR. LOMBARDI: Off the record.

(Discussion off the record)

MR. LOMBARDI: Counsel, for the record, I marked as Farone 2 a document entitled "Objections to Philip Morris Incorporated Request for Documents Set Forth on Exhibit A on Their Notice for the Taking of the Deposition of William Farone, Ph.D."

(Defendants' Exhibit 2 was marked for identification, the original of which is attached hereto.)

BY MR. LOMBARDI:

Q Dr. Farone, have you seen Farone Exhibit 1, which is the notice of taking of your deposition in this case?

A Yes, I have.

Q And have you looked at Schedule A?

A Yes, I have.

Q Have you brought any documents with you

0009

responsive to the requests on Schedule A?

A I believe so.

Q Are those documents on the table in front of us?

A Yes.

Q Okay. Now, are those all of the documents that you relied on in formulating your expert opinions in this matter?

A No.

Q What other documents are there, just in a general sense?

MR. BROWN: Object to that as overbroad and the same grounds as our objections we just filed.

Answer as best you can.

THE WITNESS: As you are aware, I produced in past cases boxes of documents, and I'm assuming that those documents are also still available to you and to me for use in this case.

BY MR. LOMBARDI:

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Courtesy of the Legacy Tobacco Documents Library (LTDL) at industrydocuments.ucsf.edu/docs/jjxd0001

Q Just to make sure that I have everything you are referring to, I think it's two boxes of documents that you have used as reliance materials in prior cases; is that right?
A That is right. From time to time, occasionally additional documents are added to those

0010

boxes, but basically that's correct.
Q Now, do I understand correctly that the documents we have on the table in front of us are documents that you believe have not previously been in your two reliance boxes?
A They are documents which I am not sure are in the reliance documents, and I did not have time to go through the box and determine whether or not they were there. So in the interest of safety and completeness, I brought them.
Q Okay. And we've talked off the record about making arrangements for copying these.
A Correct.
Q Okay. Why don't we just keep them over there.
Do you see on Schedule A there is letter asking for all of Dr. Farone's original records pertaining to Leslie Whiteley?
MR. BROWN: We objected to some of these. Will it will be stipulated that our filed objections will apply in the deposition?
MR. LOMBARDI: That's fine.
BY MR. LOMBARDI:
Q Do you see letter "A" there?
A Yes, I do.

0011

Q Do you have any original records pertaining to Leslie Whiteley?
A I have the Notice of Deposition and this memorandum or letter that was sent to me.
Q Okay. Other than that, are those the only documents you have relating to Leslie Whiteley?
A That's correct.
Q You have no medical records of Leslie Whiteley?
A No, I don't.
Q You have no records relating to Leslie Whiteley's smoking history?
A That's correct.
Q Is it correct, Dr. Farone, that you do not intend to offer any opinions relating specifically to Leslie Whiteley in this case?
Let me make sure I'm being clear. You obviously provide expert opinions relating to smokers generally, correct?
A Correct.
Q Are you going to provide any expert opinions relevant to Leslie Whiteley that are different than your general opinions on smokers and smoking?
MR. BROWN: Do you include tying in his

0012

general opinions?
BY MR. LOMBARDI:
Q You intend to provide the general opinions you set forth in other litigation; is that correct?

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Generated by tobaccoindustrydocuments.ucsf.edu/docs/jjxd0001

A Correct. And to the extent, for example, she smoked a particular type of cigarette, which maybe I'm not aware of right now, but if somebody asked me about that particular type of cigarette or its history or its design or any of the facets relating to its delivery or those items, then I would respond to those questions.

MR. BROWN: We will probably ask him questions that relate to, as you refer to it, his general opinions and ask him to relate that to Leslie, given assumed facts that he doesn't have at this point.

BY MR. LOMBARDI:

Q As you sit here today, do you know anything about Leslie Whiteley's smoking history?

A No, I don't.

Q Do you know what brand she smoked?

A No.

Q Do you know what companies she purchased cigarettes from other than Philip Morris?

A Only through inference that Reynolds' attorneys are here.

0013

Q Other than knowing who the attorneys represent that are present at this deposition, you have no information about her smoking history?

A That is correct.

Q Would you look at, again, Farone Exhibit 1, letter "M," which relates to the medical records pertaining to Leslie Whiteley.

I take it from your answers you have no such medical records; is that correct?

A That is correct.

Q Letter "O" refers to correspondence between yourself and any expert for the Plaintiffs.

Do you have any correspondence related to the Whiteley case?

A I have not.

Q Okay. So you have no documents responsive to that; is that correct?

A That is correct.

Q Dr. Farone, you are not receiving compensation in this case; is that correct?

A That's correct.

Q Do you receive compensation in some cases?

A I think there is only one case where I haven't actually billed for it yet, but not to me directly. I made a request that the compensation

0014

that would normally be paid for expert's time be paid to the American Cancer Society.

Q Which case is that?

A That is, I believe, the Neri case.

Q How do you determine whether to charge for your time in that way or not charge?

A I haven't really charged in any case, and I don't consider that really charging. But that was on the basis of going through an extra length to have to be involved in that particular case.

Q Okay. Has any Plaintiffs' attorney in this case, the Whiteley case, made any promise of future benefit to you?

A No.

Q Has any Plaintiffs' attorney in this case

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Digitized by the Legacy Industry Documents Library - http://industrydocuments.ucsf.edu/docs/jjxd0001

indicated the possibility of a future benefit to you stemming from your work on this case?

MS. CHABER: I did advise Dr. Farone that in California, expert deposition time is paid for by the party or parties taking that deposition and left him that option to charge if he so determines and apply it to wherever he wants to apply it.

BY MR. LOMBARDI:

Q Apart from that, Dr. Farone?

A No.

0015

Q Dr. Farone, have you ever made a loan to Philip Morris?

A My company made a loan to Philip Morris.

Q When was that loan made?

A About two years ago.

Q So 1997, thereabouts?

A The time of the trial where it came up, the Washington case.

Q Was it Akron? Does that sound right?

A Akron.

Q Which would have been in March of 1999? Does that sound right?

A This year, no.

MR. LOMBARDI: Off the record.

(Discussion off the record)

MR. LOMBARDI: On the record.

BY MR. LOMBARDI:

Q I'll tell you, Dr. Farone, I believe that the Akron trial was March of '99.

Does that help you place the loan?

A Yes, it does. I have the list of some of the trial dates. I don't remember them all. The loan would have been made before that because it was in existence at the time of the trial. So it would have been made in late '98.

0016

Q What were the circumstances under which you made the loan?

A In '98 we were saving money to purchase the building which is addressed on the card that I just gave you. And while the money was being saved, our broker called and asked if it would not be a good idea to put the money we were saving into some form of short-term debenture or bond or something of that type.

We said it would be a good idea, and he suggested that Philip Morris at that time had some short-term debt. I think the amounts were $40,000 -- or at least that's what our amount was. And we were asked whether that would be okay because he was aware of the fact I had testified in some of the cases. And I said, "Of course it's okay," and the loan was duly made.

Q Why did you say, "Of course it's okay"?

A Well, Philip Morris is a company that has shown its ability to pay its bills. It's a large, reliable company. As you are probably aware, I still have pension benefits that I hope to derive from Philip Morris.

MR. BROWN: You are calling this a loan, but is that accurate?

0017

http://legacy.library.ucsf.edu/tid/otl05a00/pdf Digitized by the Legacy Industry Documents Library - http://industrydocuments.ucsf.edu/docs/jjxd0001

THE WITNESS: That is the way it's viewed. It's a debt thing. What they are doing is servicing their short-term debt with money they borrow, and then they repay the money the next quarter.
MR. BROWN: Some kind of paper sold to the public?
THE WITNESS: Yeah.
BY MR. LOMBARDI:
Q Do you call that a loan?
A Yes, essentially. It's probably technically a bond or debenture. I don't know what it's called technically.
Q And, for the record, things will go quicker if I ask the questions.
You referred to it as a loan; is that correct?
A That's correct.
Q And how much money was involved? I think you said 40,000.
A $40,000.
Q And has that obligation on the part of Philip Morris matured?
A Yes.
Q And have you been fully repaid?
A I believe so.

0018

Q And by "you," in this case, we are talking about Applied Power Concepts; is that right?
A I am Applied Power Concepts, Incorporated, yes.
Q Any other loans you made Philip Morris?
A No.
Q Okay. Who is Harold Burnley? Do you know that name?
A Yes, I do.
Q Who is Harold Burnley?
A Harold Burnley, at the time that I was there, was the director of process development at Philip Morris.
Q Okay. And so you knew him when you were at Philip Morris?
A Yes, I did.
Q Did you work with him there?
A Within the general sense as director of applied research, I worked with almost all the other managers, directors, project leaders, of which he was one.
Q Would you refer to Mr. Burnley as a scientist?
A No.
Q Is there some other description you give

0019

him?
A I would say he had an engineering background.
Q Would you refer to him as an engineer then?
A Yes.
Q Okay. Based on your dealings with Mr. Burnley, was he a competent engineer?
A Well, he didn't actually, in my dealings, do actual engineering. He was more managerial related. He was managing projects. So I don't know

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Courtesy of the Legacy Tobacco Documents Library http://industrydocuments.ucsf.edu/docs/jjxd0001

that I had an opportunity to evaluate his engineering.

Q Okay. So is it fair to say that you don't have an opinion one way or another as to Mr. Burnley's competence as an engineer?

A Only to the extent in these cases that I have been made aware of various things that Mr. Burnley has apparently said or advised people.

Q I want you to focus for now on the time you were at Philip Morris. At the time you were at Philip Morris, which ended in approximately 1984 -- is that correct? --

A Approximately July 6th, 1984.

Q -- had you formed an opinion as to

0020

Mr. Burnley's competence as an engineer by the time you left Philip Morris?

A Yes, I did.

Q What was your opinion?

A I was not impressed.

Q Why not?

A Mr. Burnley was involved in projects that many of the scientists that worked for me were involved with. And those people had more physics or chemical background and seemed to have a much better grasp of the technical parts of the project than Mr. Burnley did.

Q What specific projects are you speaking of?

A I think we are talking about, for example, the laser perforation, the projects dealing with denitrification, that Mr. Burnley was involved to a minor extent in that, and some of the new products ventures.

I think, if I recall correctly, there were programs, I think, to change the packaging for cigarettes, oval cigarettes, fancy boxes, and some of which involved technology that people working for me had been involved in along the laser perforation line or along mechanical devices that were similar

0021

to the -- complicated mechanical devices.

Mr. Burnley seemed to be more of a person who was involved in managing people, you know, more of a project management person than he was in the engineering technical sense.

Q What was it that you recall that Mr. Burnley didn't understand about the laser perforation program?

A As you know from previous testimony, cigarettes are very complicated devices, and some of the facets of what happens when you change the perforations or you change where they are placed or how they are placed and the sizes as compared to some of the other parameters seem to be not well grasped by Mr. Burnley.

Q Is this based on conversations you had with Mr. Burnley?

A Yes, the various presentations discussed.

Q I want to go through them. Specifically, do you have specific recollection of particular conversations with Mr. Burnley about laser perforation?

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Digitized by the Legacy Industry Documents Library - http://industrydocuments.ucsf.edu/docs/jjxd0001

A No, not as I sit here.
Q Do you have any specific recollection beyond what you have already told me about what

0022

Mr. Burnley did not understand, in your view, about laser perforation?
A No. It's just very general.
Q Were these based on meetings you personally had with Mr. Burnley?
A Not one-on-one meetings. These were based on meetings that Mr. Burnley and I attended together.
Q Okay. How did you find out in these meetings that Mr. Burnley didn't understand laser perforation?
A Well, I think, you know, it's just general discussion. I'm just trying to recall now. I think Mr. Burnley was manager of one of the divisions reporting to Mr. Turano, and I think eventually he replaced Mr. Turano.
But I think it was about in that time frame, which would have been '81, '82, that some of these discussions took place having to do -- for example, some of them had to do with Park 500.
Q That is a plant at Philip Morris?
A That is a plant for making reconstituted tobacco. And some of Mr. Burnley's understanding of how the chemistry worked for putting together the materials that are used in sheet making were --

0023

Mr. Burnley came out of the manufacturing side into R&D and wasn't up through the ranks of someone who was hired in engineering to do engineering and then work through.
I don't think anybody disparaged Mr. Burnley. His lack of experience and expertise was considered part of training that he was receiving.
Q Did you disparage Mr. Burnley?
A No.
Q You said you did not consider him a competent engineer, or did I misunderstand you?
A I didn't say he was incompetent. I think the wording I used --
MR. BROWN: Was not impressed?
THE WITNESS: Yes, was not impressed by his engineering ability because he wasn't working in engineering.
BY MR. LOMBARDI:
Q Let me go back to laser perforation. You started talking about reconstituted tobacco in the course of your answer. I want to focus on laser perforation.
I want to know what it was about what Mr. Burnley said or did that indicated to you he

0024

didn't understand laser perforation.
A We are talking about cigarette delivery due to construction of the cigarette, and we were talking about substituting various kinds of tobacco. And I think Mr. Burnley was of the opinion that no matter what tobacco we put in there, we could get the same delivery on the cigarette by adjusting the

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Digitized by the Legacy Industry Documents Library - http://industrydocuments.ucsf.edu/docs/jjxd0001

perforation. There are other things that have to be changed to make that happen.

Q That is a specific concept that Mr. Burnley did not understand; is that correct?

A Correct.

Q Is that something that you learned in a conversation with Mr. Burnley, that you have learned that that was his view on perforation?

A As best that I can recall.

Q Okay. Is there anything else that Mr. Burnley said directly to you that indicated his lack of understanding of laser perforation?

A Not that I can recall.

Q Did you prepare a memo concerning Mr. Burnley's lack of understanding of laser perforation?

A No, I don't recall.

Q Okay. Was his lack of understanding of

0025

laser perforation something that gave you concern as director of applied research?

A Not particularly.

Q Why not?

A Well, because Mr. Burnley, as I indicated, was, as we viewed it, sort of being in training. And part of his educational process, if you want to call it that, was obtaining information from people throughout the R&D environment.

Mr. Burnley was doing what he was, I think, supposed to do, that he is supposed to talk to people and find out about things that he is involved in.

Q Okay. Did Mr. Burnley ultimately become educated on laser perforation?

A I'm not sure because I don't know what specific things he did afterwards. This is just kind of a minor thing where you are talking about concepts that you expect people in a managerial or technical level within Philip Morris to know, and he demonstrated some lack of understanding. So normally you talk about it and you explain it to him.

Q Okay. And did you explain things to him?

A I don't know that I did. I think maybe

0026

Dr. Lilly did or Dr. Banyasz or Dr. Martin. But some of the other people involved who worked for me, I think, did.

Q Okay. And you don't know whether Mr. Burnley ultimately became educated on laser perforation?

A No, I don't.

Q Okay. Because you didn't have any further conversations with him, as I understand your testimony?

A On that subject.

Q Okay. You mentioned, I think -- did you say reconstituted leaf when you were discussing something that Mr. Burnley didn't understand?

A Reconstituted tobacco.

Q What is your basis for saying Mr. Burnley didn't understand some aspect of reconstituted tobacco?

http://legacy.library.ucsf.edu/tid/otl05a00/pdf Courtesy of http://industrydocuments.ucsf.edu/docs/jjxd0001

A It's the business of why you put certain things into reconstituted tobacco. For example, the statement is made that the purpose of adding diammonium phosphate to reconstituted tobacco has something to do with binding capacities or pectin release or some chemical property.

Q Let me ask a clarifying question.

0027

Are you talking about something you have learned Mr. Burnley said after you left Philip Morris? I want to focus at the time you were at Philip Morris.

A These were conversations that took place while I was at Philip Morris.

Q That's fine. Go ahead, please.

A And the point is that in many cases it's the phosphate part of the molecule that does the binding, not the diammonium phosphate. So, for example, you could use aluminum phosphate or you could use potassium phosphate or sodium phosphate to do the same thing.

And I recall having discussions with Mr. Burnley about that the major purpose of the diammonium phosphate was the release of ammonia as opposed to putting it in as an additive because we needed to have diammonium phosphate be the pectin-releasing agent, if you want to call it that.

Q Is it one conversation or more than one conversation?

A I would say it's more than one. I didn't have all that great contact with Mr. Burnley, but we would frequently have these discussions when, like, for example, I would be meeting with Mr. Turano in

0028

his office and Mr. Burnley would be there or in my office or as part of preparations for, say, Richmond meetings or after Richmond meetings where a presentation had been given where we would discuss it and dissect it. So it wasn't a very frequent occurrence.

Q I want to focus specifically on the conversation or conversations involving reconstituted tobacco that you just mentioned to me.

On how many occasions did have you those conversations with Mr. Burnley?

A Don't recall.

Q Was it more than once?

A I can only recall one instance in my mind, so I can't say it was more than once.

Q Do you recall anybody else who was present during that one instance?

A Not specifically. I can tell you who probably was present.

Q I just want your actual recollection as you sit here.

A There were other people there because I don't think Mr. Burnley and I had many one-on-one conversations, but I don't remember the group.

Q Was this a situation, as you described

0029

before, where you were educating Mr. Burnley about something relating to the reconstituted tobacco process?

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Courtesy of the Legacy Tobacco Documents Library (LTDL) http://industrydocuments.ucsf.edu/docs/jjxd0001

A That is the way I perceived it.
Q Okay. And you were providing him with information that you believed he did not already have at that point; is that correct?
A I was providing him with information that I believed he did not understand. I don't know whether he had it or not. He may have heard it from someone else.
But that's part of chemistry we call colloid chemistry. It's why things either coagulate or stay dispersed. Part of our mission or role within Philip Morris was to provide that type of expertise.
Q Did you reduce your meeting with Mr. Burnley to writing in some way?
A Not specifically for Mr. Burnley. But I do think I wrote a memo about the applicability of diammonium phosphate and the ability to use other phosphate materials in place of that.
Q Okay. Let me focus first on Mr. Burnley and then we will move to the memo you talked about.
Do you have any memos specifically

0030

memorializing the conversation concerning reconstituted tobacco with Mr. Burnley?
A Not that I recall.
Q Now, you just made mention to a memo generally about the applicability of DAP and the ability to use other phosphates.
Do I have that right?
A Right.
Q When was that memo written?
A I don't recall. I recall that Gus Keritsis was involved --
Q I think you need to spell that.
A K-e-r-i-t-s-i-s -- was involved in discussions because he had shown through his earlier work, as I recall the reports at Philip Morris, that you could use other materials.
And so I was sort of supporting what was in the Philip Morris literature that had been done previously as a result of the current ongoing discussions we were having at that time about different ways to make sheet materials.
Q Okay. Gus Keritsis was an employee of Philip Morris?
A Correct.
Q What was his title or his department?

0031

A He was a project leader, and I believe at that time he either worked for Mr. Burnley or in an area closely allied to Mr. Burnley directly in Mr. Turano's directorate.
Q And the name of Mr. Turano's directorate was, as you recall?
A Process development, director of process development.
Q You recall Mr. Keritsis having prepared some memos relating to DAP.
A He earlier prepared reports relating to the use of different materials in making sheets, reconstituted tobacco. And we had had a discussion including him performing some experiments using

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Creative Commons https://industrydocuments.ucsf.edu/docs/jjxd0001

different phosphorus materials like aluminum phosphate, the ones I mentioned earlier. And I think I wrote a memo, and there was some exchange.
Q And the memo you are referring to is the one you wrote on the applicability of DAP and the ability to use other phosphates in the reconstituted tobacco process?
A That's correct.
Q To whom was your memo addressed?
A I don't recall.
MR. BROWN: Would you identify this

0032

abbreviation you are using, DAP, or whatever it is?
MR. LOMBARDI: He did.
THE WITNESS: Diammonium phosphate.
BY MR. LOMBARDI:
Q And, again, do you recall the date this memo was written?
A Not specifically.
Q When did you last see this memo?
A Early 1980s.
Q You haven't seen it since then?
A No, I haven't, but I think I have seen some of the reports that Keritsis wrote that were the precursor to my writing that memo, if that is clear to you.
Q I think it is, but what is not clear to me is whether you are saying you actually have seen those reports since you left Philip Morris or you are not sure whether you have seen those reports?
A I've actually seen some of them. I'm not sure I have seen them all. But on the Minnesota website, if you go under Keritsis, you will find some of the work he did. And I read those.
Q Based on your exposure to Mr. Burnley, did you consider him honest?
A I formed no opinion on that.

0033

Q Not one way or the other?
A No.
Q Did you consider him hardworking?
A Again, I didn't have enough information to base that conclusion.
Q Have you had any contact with Harold Burnley since you left Philip Morris in 1984?
A Not direct contact, personal contact. I just am aware of him as he participated in some of the testimony or some of the things that have gone on with regard to these various litigations.
Q Other than being aware of what he may or may not have said during litigation, have you had no contact with Mr. Burnley since 1984?
A That is correct.
Q And you have not spoken to him personally; is that right?
A That's correct.
Q And you have not corresponded with him?
A Yes.
Q Who is Jerry Whidby?
A Dr. Whidby was, when I first went to Philip Morris, a scientist in the analytical research division, and over the years I became impressed with the work he was doing. And he did a

http://legacy.library.ucsf.edu/tid/otl05a00/pdf Digitized by the Legacy Industry Documents Library - http://industrydocuments.ucsf.edu/docs/jjxd0001

0034
lot of work, for example, on modeling nicotine, along with Jeff Seeman.
And his computer skills encouraged me to get him moved into the computer applications division under my directorate. And his managerial skills, plus his chemistry background, convinced me that he should have managerial potential.
So I agreed with the directors and the vice-president of research that he should be promoted to manager of, at that time, the biomaterials applications division where he was the manager of that division.
Q And was he working the entire time that you were at Philip Morris within your directorate?
A In the beginning he worked in Dr. Osdene's directorate.
Q I think from your answer I heard he had a chemistry background; is that right?
A That's correct.
Q You referred to him as Dr. Whidby?
A That's correct.
Q Did he have a Ph.D. in chemistry?
A Yes, I believe so.
Q Did he do chemistry work within your directorate?
0035
A While he was in my directorate, he was either a manager or he was doing computer work. To the extent you can use computer programs to do chemistry, I guess you can call it chemistry work.
Q Fair enough. Was he doing chemistry work before he moved into your directorate?
A He was in the analytical research division. He was doing analytical chemistry.
Q And then you brought him into your directorate doing computer modeling work?
A Correct, because that is what part of his work in the analytical research division was, computer modeling. I think he made one of the first animated sequences of the nicotine molecule. I think it was shown at some of the externally published meetings where you could actually watch it move and rotate and turn and things of that sort.
Q When you say "externally published meetings," you are referring to some scientific organization outside of Philip Morris; is that correct?
A That's correct.
Q And then you identified him as someone with managerial potential; is that right?
A That is correct.
0036
Q And I don't think I got the exact name of the group that you put him in charge of.
A Biomaterials research.
Q Okay. And did he hold that position at the time you left Philip Morris?
A That is correct.
Q Based on your exposure to him, was Mr. Whidby a competent scientist?
A Yes, he was.
Q Was Mr. Whidby honest based on your

http://legacy.library.ucsf.edu/tid/otn05a00/pdf
Digitized by the Legacy Industry Documents Library - http://industrydocuments.ucsf.edu/docs/jjxd0001

exposure to him?
A As far as I know.
Q Okay. Was he hardworking based on your exposure to him?
A Very much so.
Q Sir, you have testified in the past about the meaning of the word hypothesis and the role of a hypothesis to a scientist.
A That's correct.
Q Let me see if I got it right, and you tell me if I don't. A scientist comes up with a hypothesis and, in your view, accepts that hypothesis as true if nobody comes up with proof to the contrary; is that's correct?
A Not quite. Almost. The point is that

0037

you, in essence, because of various laws that we now accept, the laws of thermodynamics, quantum mechanics, and a thing called the Heisenberg principle, you really can't prove anything. All you can do is disprove things.
We formulate a hypothesis, and if you can't disprove the hypothesis, it becomes a theory. If you continue to test it but you can't disprove the theory, it becomes a law.
All of statistics is an integral part of this. You cannot do anything in science without statistics. That is what quantum mechanics has taught us, and that is what it is really all about.
So the hypothesis isn't just something you accept because you just made it up. It's something which all the facts must agree with. And then you continue to test it repeatedly to make sure that it is, in fact, true.
And as you continue to test it, if you can't come up with evidence to the contrary, as a scientist, you are forced to accept it even if you don't agree with it. It's scientific truth until in your laboratory or in somebody else's or in some way you can provide evidence that that is wrong.
Q At what point does a hypothesis become a

0038

theory?
A When it's generally accepted by the scientific community.
Q What point does a theory become a law?
A When it continues to be accepted and no proof to the contrary has been provided.
Q Okay. Does experimental work play some role in the progression of hypothesis to theory to law?
A Usually.
Q And what is the usual role that experimental work plays?
A Usually, experimental work provides the test of hypothesis, provides the test of theory, even the test of law -- of scientific law. You will formulate an experiment or experiments that are intended to test the hypothesis, the theory, or the law.
Q Okay. And experimental work, in the usual case, does that lead to data or some kind of results?

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Creative Commons https://industrydocuments.ucsf.edu/docs/jjxd0001

A Usually.
Q Okay. And what is the significance of the data that is generated in an experiment to the hypothesis-theory-law progression?

0039

A Usually, when you decide to set up an experiment, that is what we call an experimental design. You determine how you are going to go about testing the hypothesis, and then you set up the experiment to perform that test.
So statistically, ahead of time you usually try to determine how much data you need or how the data has to be directed to have reasonable confidence in the result. And the normal levels that are accepted are like 90 percent, 95 percent, or 99 percent. Those are the reasonable levels.
Q Have you heard of something called a "high puff count cigarette"?
A Yes.
Q What is your understanding of what that term means?
A High puff count cigarette, if I recall correctly, a couple of the models that I recall, it burns slowly. In most cigarettes you can get seven to eight puffs. Sometimes you can get 10. The ones I recall allow like 14 or 15 puffs per cigarette.
Q I take it from the way you answered that question that that is something you recall being discussed during your time at Philip Morris?
A Yes.

0040

Q What was the purpose, as you understood it, of a high puff count cigarette at the time you were at Philip Morris?
A Well, the discussion that we had, I think, were along the lines of the projects. These were alternative cigarette designs that were being studied at the time.
And many of those materials, the totally reconstituted rods that were being burned as potential replacements, if you will, for conventional cigarettes were high puff count cigarettes.
Q Okay. Is a high puff count cigarette an example of a concept to, at least in theory, make cigarettes safer?
A It could be, but not necessarily. More puffs, you could argue, is also worse. It's just that those particular cigarettes were designed to have lower biological activity or that an attempt was being made.
Q You said you could argue that more puffs would be worse. In what sense do you mean that?
A More puffs, more carcinogens.
Q How could more puffs under any circumstances be safer?

0041

A Well, in previous testimony we've talked about some of the alternative designs. If you know what you are delivering has been tested and it only includes materials which are acceptable from a toxicological viewpoint, then a high puff count cigarette could be a way to make maybe more

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Generated by tobaccoindustrydocuments.ucsf.edu/docs/jjxd0001

economical something that might cost more.
Take the Accord, for example, because it's relatively expensive, if we make more puff counts, that makes it more affordable per smoking experience, if you will.
Q Is it true the high puff count aspect of a theoretical cigarette itself is at best neutral in terms of safety?
MR. BROWN: Objection vague and ambiguous as to "at best neutral."
THE WITNESS: I think I just said that it could be bad or could be good. If bad and good averages out to neutral --
BY MR. LOMBARDI:
Q Let me ask you again. As I understood your answer -- and correct me if I got it wrong -- I think your answer was along the lines that if you have taken all the harmful elements out of the smoke and the tobacco, then high puff count wouldn't

0042

necessarily be bad.
Do I have your testimony correct on that?
A That's correct. If you have safety testing and information on all of the ingredients so you are comfortable with it, then it isn't necessarily bad.
Q But the high puff count in and of itself isn't something that makes a cigarette safer, as I understand your testimony?
A That's correct.
Q So high puff count could be less safe if you don't remove all of the harmful constituents; is that right?
A That's correct.
Q Or it could be something that doesn't add any greater harm if you removed all the harmful constituents; is that right?
A I can agree with that.
Q Did you do any work on a high puff count cigarette at Philip Morris?
A Not personally. People working for me like Cliff Lilly was involved in that exercise. Joe Banyasz, I believe, was. Peter Martin, Homer Hartung, and a bunch of people working for me were involved.

0043

Q I think you have stated this was part of the nonconventional cigarette work that was going on at Philip Morris.
A It was two things: nonconventional cigarette work and also modeling.
As you probably are aware, Dr. Homer Hartung developed this multiparameter model that allowed us to predict deliveries and all kinds of things about a cigarette.
And puff count is one of the things that you predict or that you enter into the equations for the predictions of other things. It was studied as part of that exercise to understand everything there is to know about cigarettes and how they deliver, what they deliver.
Q Did you ever suggest that Philip Morris market a high puff count cigarette?

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Source: http://industrydocuments.ucsf.edu/docs/jjxd0001

A I don't recall.
Q Is it possible you did?
A Yes. I mean, under the circumstances we were talking about, you could incorporate the concept of high puff count into a safer cigarette.
Q Meaning the nonconventional cigarettes that were being worked on at that time?
A Correct.

Q Is it possible that you suggested a high puff count cigarette outside the context of a nonconventional cigarette?
A It's possible. If you look at a long cigarette, you know, King and then Super King cigarettes come 85 millimeters, 100 millimeters, 120 millimeters. Basically, the longer the cigarette the more puffs you get out of it.
So with a high puff count cigarette, you could get the equivalent of a 100 millimeter cigarette in an 85 or the equivalent of a 120 millimeter cigarette in an 85.
Q I just want to make sure I understand your testimony. Are you saying that that is a potential context in which you proposed a high puff count cigarette, or you just don't remember?
A I don't remember. I think the question was if it would be possible that I did, and that is -- I mean, that would be -- I'm giving you an example of a very likely discussion I may have had. Those kind of things were posed to me all the time while I worked there.
Q I just want to make sure you understood my prior question. Specifically, I just want to make sure this is not something you have a specific

recollection of as you sit here today?
A That is correct.
Q Dr. Farone, you have heard and used the term "gas phase" when talking about nicotine; is that right?
A That's correct.
Q How do you define gas phase in that context?
A If you look at all of the material that you put into a cigarette, you know, let's say there is, oh, I don't know, 700 milligrams, something like that, and then we burn it, you can essentially break it down into four components.
There is mainstream particulate phase, mainstream gas phase, sidestream particulate phase, and sidestream gas phase. So you can have two different gas phases. You can have the gas phase in the sidestream and you can have the gas phase in the mainstream.
Q I have heard some people define gas phase in a way that I would call operationally -- that may be the wrong word, but you will tell me -- to mean anything that goes through a Cambridge testing pad in the FTC test.
Do you accept that definition?

A That would be a definition that would be related to the gas phase of the mainstream smoke.

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Downloaded from industrydocuments.ucsf.edu/docs/jjxd0001

It doesn't include the gas phase that is in the sidestream smoke.

If you take the further step of saying we are going to operationally, if you want to call it that, define what we collect on the pad as being the total particulate matter or the tar, however you want to define that, what you don't collect on that pad, but having gone through it, you could say was gas phase.

Q I want to focus on your definition. Is that the way you use gas phase in this operational sense relating to the Cambridge pad?

A You can. For the purposes of talking about deliveries, you can, and we do use it that way.

The point you have to be aware of is that there is no real guarantee that the distribution between particulate and gas on the pad and what goes through is the same as in your mouth or in your lungs in the real delivery.

And to that extent, we have programs at Philip Morris where we were measuring the particulate phase in the air, the aerosol itself,

0047

trying to measure that light scattering. And we were using aerosol centrifuges and various kinds of things to distinguish what is collected on the pad and what is the in the aerosol phase delivered to the smoker.

For purposes of comparing things, gas versus particulate, very frequently one accepts the operational definition of the Cambridge pads because it's a convenient way to be able to talk specifics about what is liquid or what is gas.

Q Okay. And I guess what I want to know is, as you use the term today when you are talking about gas phase of nicotine, are you talking about it in an operational sense as we just discussed or some other sense?

A All of the above. It depends on context. When I use it, it will be related to the context. That is important. So if we are talking about results, for example, from a smoking machine, then it would be related to what is on the pad is what goes through. If you are talking about results delivered to a smoker, then that is not the same thing.

Q Okay. So the bottom line on this is your definition of gas phase will depend on the context

0048

in which you are using the term?

A I would venture to say the definition of anything depends on the context in which you use it.

Q In this particular instance, there are some instances where you, William Farone, use gas phase in what we call the operational sense?

A That is correct.

Q And there are times you do not use it in what we call the operational sense; is that correct?

A That's correct.

Q Now, sir, I'm going to try to repeat, I think, a theory that you have on nicotine displacement in order to expedite things. If I have

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Digitized by the Legacy Industry Documents Library - https://industrydocuments.ucsf.edu/docs/jjxd0001

it wrong, just correct me, and we will go back. This is in interest of trying to move things along here.

Your theory is articulated in testimony before that when you light a cigarette, ammonia is released during the combustion process. It sweeps -- I think is the word you used -- along the rods of the cigarette and displaces nicotine?

A That's correct.

Q Okay. And do I have the theory right at least?

A That's a general characterization.

0049

Q Okay.

A Since I used at the trial where you asked me the questions, we are both familiar with it.

Q You also, as part of that theory, indicated that the tobacco that the ammonia sweeps along has been moistened by the water that comes out during combustion; is that correct?

A When you burn things, you create water. Water condenses and moistens the tobacco.

Q And then it replaces the nicotine that is on the tobacco. Do I have that right?

A It doesn't really replace it. It creates locally a basic condition which puts the nicotine in the quote, "free form," unquote, and that allows it to be vaporized much more easily.

Q Okay. And I'll get to that in a little more detail.

Is that the general idea? Can I call it the nicotine displacement theory?

A You can.

Q Does that identify it from your point of view?

A It doesn't really identify it, but you can call it that for purposes of this deposition for discussion, yes.

0050

Q Have you seen that theory articulated in the scientific literature?

A Yes.

Q Where?

A One of the documents I brought is Dr. Osdene's work -- not his work, but a summary of the work that he published in 1975. It provides a background discussion. It provides an unequivocal way to measure the gas phase and particulate phase for both sidestream and mainstream.

There are patents that were issued Philip Morris which shows what happens when I sweep ammonia across tobacco. And as a matter of fact, Philip Morris originally had a tobacco expansion process called the Westab process that was based on essentially ammonia. It was well known at that time that the ammonia removed the nicotine.

And the other thing is at Philip Morris we prepared denicotinized cigarettes. And the way we prepared denicotinized cigarettes for use in panel testing for Dr. Dunn and for Mr. Goldsmith was by using ammonia to remove nicotine.

So the process that I'm talking about has been tested widely and proven in these various

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Digitized by the Legacy Industry Documents Library - http://industrydocuments.ucsf.edu/docs/jjxd0001

documents that relate to using ammonia in this
0051
manner and I think is fairly well accepted by people -- scientists.
Q Let me go back and make sure I have the universe of what you are talking about first, and then we will go through the components of that.
You have referred to places where this nicotine displacement theory is set forth in the literature as including an article by Dr. Osdene.
A That is not where it's set forth. That is the background by which you could tell whether nicotine is being displaced into the gas phase or not. It's a scientific methodology you can use to test the theory or hypothesis, if you will.
Q So I'm clear, the Osdene work itself doesn't state this particular nicotine displacement theory?
A That's correct.
Q But you consider it to offer scientific or experimental proof of that theory; is that right?
A It provides a background by which you, as a scientist, would want to test any hypothesis. Okay. This is the framework you could use to do that in.
Q And you accept the framework set forth by Dr. Osdene as a valid way of looking at the nicotine
0052
displacement theory?
A Yes. Not just because it was done at Philip Morris by Dr. Osdene, but that article also refers to earlier papers done independently by several laboratories where for, for example, they corroborated work done at Philip Morris.
When you, in fact, burn a cigarette, 95 percent-plus of the nicotine is removed unchanged. The number is as high as 98. So it's important that when we talk about nicotine, that we have a certain amount that cigarettes start off with and that there are only four places it can go.
It can go in the mainstream gas phase, the mainstream particulate phase, the sidestream particulate phase, and the sidestream gas phase. If it all doesn't end up in one of those four places or at least 95 to 98 percent of it doesn't end up in one of those four places, then we have a serious scientific problem known as mass balance. You lost it.
Q You are referring to the Houseman paper?
A Yes.
Q That is specifically referenced in the Osdene work you characterized as background for your theory?
0053
A Correct.
Q Now, the other area where you said this nicotine displacement theory has been articulated in is in patents issued to Philip Morris?
A Right.
Q And that is a Cliff Lilly patent, in particular?
A That's right.
Q What does that patent relate to?

http://legacy.library.ucsf.edu/tid/otn05a00/pdf
Digitized by the Legacy Industry Documents Library - http://industrydocuments.ucsf.edu/docs/jjxd0001

A It relates to extracting things from -- there are two of them. I have to go back and look at it.
Q Do you have a recollection right now what Lilly's patent relates to?
A Not right now. I haven't looked at it in a few months.
Q Is there anyplace else the nicotine displacement theory is articulated in the scientific literature that you are aware of, the theory itself, not background for the theory?
A I mean, I haven't looked specifically at papers in a long time, but I know of similar papers on ammonia and delivery of nicotine.
Q All I can ask you is what you know right now. As you are sit here today --

0054

A Outside literature, no, I don't recall.
Q I have to finish the question so we have a clear record, so I'll repeat myself.
As you sit here today, are you aware of any other outside literature that articulates the nicotine displacement theory other than the Osdene work, references within the Osdene work, and the patents issued to Philip Morris?
A We have to define what we mean by "outside literature." I presume you are not talking about the attempts by other cigarette companies to duplicate the Marlboro. That would be inside literature.
Q I'm talking about publicly available literature. Let's talk about literature published scientifically.
A If you limit it to peer-reviewed literature, then I'm not aware of it.
Q We've got the Osdene work and references contained therein and the patents issued to Philip Morris as the publicly available literature that articulates the nicotine displacement theory?
A Right. I'm sorry.
Q You are indicating you have something to add?

0055

A "The Wall Street Journal" stuff on ammonia by Alix Freedman, that was all done independently of my theory.
Q Do you consider Alix Freedman a scientific writer?
A No. She is a writer for "The Wall Street Journal" newspaper, but she was presumably reporting on other people's theories or other people's information.
Q Do you consider "The Wall Street Journal" a reliable source for scientific theories?
A I consider each source independently. I have to see what is referenced. It was one that was likely available is my point, and it refers to other people's opinions with regards to this theory, not to mine.
Q Okay. Do you consider "The Wall Street Journal" article that you are referring to written by Alix Freedman and relating to ammonia to be reliable scientific literature?

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Courtesy of the Legacy Tobacco Documents Library at industrydocuments.ucsf.edu/docs/jjxd0001

A I'm not sure to the extent it might have been based on the papers that were made public at some point. I'm not sure where it came from.
Q My question to you as a scientist is do you rely on that article?

A No, I don't rely on it.
Q It's not the kind of thing you would cite in a publication you were giving to a scientific journal, I take it?
A I could.
Q You would?
A I have.
Q Do you consider that good science to cite something from "The Wall Street Journal"?
A Well, it's good science to cite wherever your sources are. It doesn't have to be -- in science we have peer-reviewed articles, and we have articles that aren't peer reviewed. And you don't necessarily limit your citation to a peer-reviewed article.
So I'm not saying that it was scientific; I'm just saying it's a reference that someone can use to find out more about the subject.
When I provided the Food and Drug Administration with my original paper on nicotine manipulation, one of the criticisms in these depositions is it contains a whole bunch of references that aren't scientific articles. There is no rule that limits citations to scientific articles.

Q Okay. I just want to make sure I understand. "The Wall Street Journal" is a legitimate source of scientific information in this instance; is that right?
A In many instances, not just this instance.
Q In this instance --
A I didn't say it was a legitimate source.
Q I want to understand what you are saying. Let me ask you, is it a legitimate source of scientific information in the instance of the Alix Freedman article on ammonia?
MR. BROWN: Sounds like the question is asked and answered.
THE WITNESS: I would have to look at the article again. I would have to read the article. My recollection of the article is that it reports the opinions of other people. It's not Alix Freedman making a conclusion.
To the extent she has references for those other things that she is talking about that came from scientists, that would be legitimate.
BY MR. LOMBARDI:
Q Okay. And do you know, as you sit here today, whether that is the case?
A I believe that's the case as I sit here

today. That is my understanding.
Q How long ago did you look at the Alix Freedman article?
A It's been years.
Q Okay. Sir, have you published an article

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Digitized by the Legacy Industry Documents Library - http://industrydocuments.ucsf.edu/docs/jjxd0001

concerning the nicotine displacement theory?
A Have I published an article? You mean outside of the expert opinions and --
Q I understand your problem. Let me rephrase it. I'll break it down so it can be easier for you.
Have you published an article, a peer-reviewed article, for a scientific journal concerning the nicotine displacement theory?
A Not yet.
Q Do you have one in the works?
A Not any draft, but I'm working on several projects related to this exact thing.
Q So your intention is to have an article for the peer review scientific literature at some point; is that correct?
A That's correct.
Q Okay. But as of this time, you don't have one today, and you haven't had one in the past; is that correct?

0059

A Not peer review, correct.
Q Have you had an article for the scientific literature concerning the nicotine displacement theory that was not peer reviewed?
A For the scientific literature, no, I don't believe so.
Q Have you had any public articulation of the nicotine displacement theory other than statements have you made to the FDA or statements you've made in the course of tobacco litigation?
A I believe so.
Q Okay. What other articulations of the nicotine displacement theory have you had?
A I believe I have been interviewed by BBC and "60 Minutes" and all kinds of people, and I think I have articulated that theory to some of them. How many? I don't recall.
Q And it's not necessary you recall specifically for my purposes.
Outside of the opinions you have expressed to the FDA, opinions you expressed in tobacco litigation, and interviews you have given to various media outlets, have you articulated the nicotine displacement theory in some public forum?
A I think it may have been part of the

0060

information I provided to the state of Massachusetts. That was public forum, I believe.
Q And I just need to know which state of Massachusetts proceeding. Is this the lawsuit brought by the state of Massachusetts against the tobacco industry?
A I believe it was the committee hearing that they had on the legislation, the regulatory legislation.
Q Okay. All right. I understand what you are saying. I'll refer to that as the Massachusetts proceedings. Is that acceptable?
A That's fine.
Q Other than the Massachusetts proceeding, opinions you express in litigation, opinions you have expressed to the FDA, and interviews to various

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Digitized by the Legacy Industry Documents Library - http://industrydocuments.ucsf.edu/docs/jjxd0001

media outlets, have you publicly articulated the nicotine displacement theory anywhere?
A We talked about the media. No. That's correct. We covered it.
Q Have you personally done any experimental work to demonstrate the truth or falsity of the nicotine displacement theory?
A You mean other than the work that was done at Philip Morris when I was there? Do you mean

0061

me personally since leaving?
Q At any time have you personally done experimental work to prove or disprove the nicotine displacement theory?
MR. BROWN: By "personally," do you mean under his direction?
MR. LOMBARDI: I mean him personally in the lab, hands on.
BY MR. LOMBARDI:
Q Do you understand that?
A No.
Q Do you understand some scientists are in the lab and they have the test tubes and various materials and perform the lab work?
A I understand that.
Q Let's start at that level. Have you performed the lab work on experiments done to determine the truth or falsity of the nicotine displacement theory?
A No, I have not.
Q We will just say, at any time have you supervised work done by scientists to prove or disprove the nicotine displacement theory?
A Yes.
Q Okay. When?

0062

A At Philip Morris we had quite a bit of work going on. A fellow named Scott Osborne did a whole bunch of experiments with what we call sparging. Sparging is the act of putting gases through tobacco to remove various components. Scott used ammonia as one of the gases. Scott worked in the physical research division which was under my direction.
Q I missed his last name.
A Osborne, O-s-b-o-r-n-e.
Q Which part of the nicotine displacement theory did Scott Osborne work on?
A The part that says that when you sweep it across tobacco, it displaces the nicotine that is in the tobacco and moves it in the gas phase.
Q And what type of experiment did he do to establish that?
A If I recall correctly, he had tobacco of varying kinds and types, and he swept the gas through the tobacco of various kinds and types at various relative humidities and moisture contents to, in fact, show nicotine was removed from the gas.
Q How did he show that nicotine was, in fact, removed from the gas?
A Chemical analysis.

0063

Q How did he do the chemical analysis?

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Courtesy of the Legacy Tobacco Documents Library (LTDL) http://industrydocuments.ucsf.edu/docs/jjxd0001

A I don't know whether he did it. I don't think he did. I think he sent it to the analytical chemistry department or he collaborated with them.
Q And what result did Scott Osborne obtain or the analytical chemistry department obtain?
A As I understand, if I recall, the work was consistent with Cliff Lilly's work. If you take tobacco and you sweep ammonia through it, you can remove nicotine.
Q Okay. Was the work Scott Osborne did with a lit cigarette? Was that part of the experimental procedure?
A I don't recall whether he did work with lit cigarettes.
Q Whether at Philip Morris or thereafter, have you supervised experimental work to prove or disprove that nicotine displacement theory that used lit cigarettes as part of the experimental procedure?
A Supervised directly like someone I told to go do the experiment?
Q We will start there.
A I don't recall having told someone to do the experiment.

0064

Q You are leaving open the possibility you supervised in some other sense?
A Yes.
Q Before you describe in the context of the nicotine displacement theory, tell me what other type of supervision you are referring to generally.
A Well, as you are probably aware, Philip Morris has the possibility of having scientists from more than one group work on projects together.
So, for example, if Dr. Osdene had a project in his directorate where he was doing work and I had scientists in my directorate who might be useful on that project, they would take part on that project. To that extent, I supervised a portion of the scientists involved in the project then.
Q Understood. Now, using "supervised" in that sense that you just stated for us, did you ever supervise, work to prove or to experimentally prove or disprove the nicotine displacement theory that used a lit cigarette as part of the experimental method?
A Yes, we did. And I think -- well, I recall that that work was part of the methodology described by Dr. Osdene in his paper. There is two ways that I think it occurred. One is using

0065

radioactive tracers to measure the amount of nicotine put into the gas phase as a result of different levels of ammonia or ammonia-releasing compounds in the filler.
Q Okay. That is one?
A That is one.
Q Okay.
A And the other was as the result of work done by John Lephardt where I think, as I recall, nicotine, among other things, was being measured directly as it came off the cigarettes.
Q And just so that I understand a little bit

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Digitized by the Legacy Industry Documents Library - http://industrydocuments.ucsf.edu/docs/jjxd0001

further about what Mr. Lephardt did, he would take a lit cigarette and somehow measure the nicotine that came off of the lit cigarette?

A Earlier we talked about a Cambridge pad. There is another way to collect the material that comes off the back of a cigarette, a coal trap. You can essentially liquify everything that comes off -- maybe except for some portion of the carbon dioxide. But you condense it. It's called whole smoke condensate.

I believe experiments were done collecting whole smoke condensate, which would be the sum of the gas phase, and correlating the nicotine and the

0066

whole smoke condensate with the amount of the ammonia and the amount of ammonia-releasing chemicals that were in the cigarette.

Q So this experiment would show on the one hand how much ammonia or ammonia-releasing chemicals were in the cigarette, and on the other hand would show how much nicotine came off the cigarette; is that right?

A Well, yeah. You would know from the construction of the cigarette and what you put in it. You would see ammonia. You could measure that. You could also measure nicotine.

Q So that particular experiment, would that tell you, for instance, that ammonia was replacing nicotine?

A No, I don't think it would tell you that it was replacing nicotine. What you would see is the ammonia you put in, the more nicotine you get out. Science tells you ammonia replaces nicotine.

Q I understand what you said about the Osdene test, and I understand what you have said about the Lephardt test.

A Okay.

Q Are there any other tests with lit cigarettes to prove or disprove the nicotine

0067

displacement theory?

A Well, other tests? Maybe you could be more specific.

Q Other experimental work. Any other experimental work?

A You mean scientific experimental work?

Q Is there another kind of experimental work that you do?

A Sure.

Q Well, what is scientific experimental work?

A It's normally done in a laboratory where, you know, you have controls and the rest of it. The other kind of experimental work is where you use a general population where you can't control all of the variables, but you can still deduce the results if you do your statistics correctly.

Q Is that epidemiological?

A It's not necessarily epidemiological that talks about some kind of a disease or something like that.

If, for example, you gave people different cars with different kinds of gasolines and then you

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Courtesy of the Legacy Tobacco Documents Library http://tobaccodocuments.ucsf.edu/docs/jjxd0001

measured the miles per gallon that they got as a function of different cars and, you know, Exxon

0068

versus Mobil versus Shell, you can come to some conclusions about which one of those gasolines might be more sufficient. It's not a laboratory experiment, but it's certainly a valid construct of an experiment.

Q I want to make sure I have the terminology right. Scientific laboratory work is work done in a lab as opposed to work done with populations somehow?

A Yeah, but they both could be scientific. I don't want to imply the work done with populations isn't scientific.

Q I'm just going with your words.

A Yes.

Q Was there any other scientific laboratory work that you have done other than the Osdene work with radioactive tracers or the Lephardt work that tested the nicotine displacement theory with lit cigarettes?

A Okay. Now, we call it --

Q Can you answer that question?

A I guess I say yes.

Q What?

A The problem is you characterize it as being "the Osdene work." Osdene didn't do the work;

0069

it was done by Bob Jenkins.

Q I appreciate the correction. I was using a label. Your point is well taken.

You have described to me scientific laboratory work that tested the nicotine displacement theory using a lit cigarette that included radioactive tracer experiments, correct?

A Correct.

Q And the John Lephardt work involving measuring nicotine came off a lit cigarette?

A Correct.

Q Is there any other scientific laboratory work that you did or supervised that tested the nicotine displacement theory using a lit cigarette?

A Not that I can recall.

Q Okay. And if I've got this label wrong, tell me, but I don't know exactly how to label the last set of work you referred to. Is it population work of some sort?

A Correct.

Q Did you do some type of -- or have you done over the course of time population-type work to test the nicotine displacement theory using a lit cigarette?

A Yes.

0070

Q Okay. What population work have you done?

A Well, in my opinion -- and this was widely held at Philip Morris at the time -- that that is one of the big factors in the Marlboro success during the fifties. The rise of popularity of Marlboro is closely tied to the use of the ammonia materials in that cigarette.

Q And is the use of Marlboro evidence of

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Courtesy of the Legacy Tobacco Documents Library http://industrydocuments.ucsf.edu/docs/jjxd0001

the accuracy of the nicotine displacement theory; is that correct?
A It's evidence; it doesn't prove it.
Q Okay. You would consider --
MR. BROWN: Just a second.
(Pause in the proceedings)
BY MR. LOMBARDI:
Q Let's go back. You had mentioned, I think in passing at least, how the ammonia replaces the nicotine, and I think you said it really doesn't replace it. And you went further than that. I would like to focus on that, Dr. Farone. As I understand it, the ammonia sweeps along the rods and then replaces the nicotine.
Is it acceptable to say it replaces the nicotine?
A Probably not.

0071

Q Okay. And why do you say that?
A Well, nicotine exists in a dynamic equilibrium between the so-called protonated form and the free form.
For example, one of the things that I have testified to probably 100 times but still is difficult for people to understand is that if I have a cup like the one sitting in front of you that has water in it and you put nicotine in that water, there is always a small amount of nicotine that is in the free form that escapes outside the water.
To the extent you don't have a lid on the cup, it will eventually migrate away from the water. When that happens, you have removed some of the free nicotine from the solution. What is left has reorganized itself to give you a very small percentage of free nicotine again, and those molecules go into what we call the head space and they drift out.
So if you put nicotine in water or in wet tobacco and you let it sit there long enough, you will, in fact, remove all the nicotine from the tobacco. It's a natural process of diffusion of the nicotine leaving, and this equilibrium between free and protonated always assures us some small

0072

percentage of the nicotine is in the free form.
Q Okay. I want to focus on whether I'm right or wrong using the word "replace" specifically for right now.
A That's wrong.
Q Okay. So it's not a situation, I take it, where ammonia somehow comes in and knocks a nicotine molecule off of the tobacco and binds to the tobacco itself?
A Could be, but that is a --
Q Do you know, I guess, is my first question.
MS. CHABER: Well, you interrupted his answer.
MR. BROWN: Go ahead.
BY MR. LOMBARDI:
Q Go ahead.
A I'm not prepared to discard your hypothesis.
Q Why not?

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Digitized by the Legacy Industry Documents Library - http://industrydocuments.ucsf.edu/docs/jjxd0001

A Because it could happen in a small percentage of the cases.
Q Do you have experimental data to discard my hypothesis?
A Do I have experimental data to discard your hypothesis? Yes, because it works in water.

0073

There is no tobacco involved.
Q But you are not prepared to discard my hypothesis?
A Yes.
Q You may discard my hypothesis based on the experimental data that you have derived from a cup of water separate from a lit cigarettes; is that correct?
A Well, what that proves is that it's not a necessary condition for the ammonia molecule to displace the tobacco. Okay. All that is required to make a change like I'm talking about is a slight change in pH, a slight increase in the pH locally in the cup of water on the tobacco.
That would, in fact, cause more of the nicotine to be in the free form and wouldn't cause the vapor pressure of the free form nicotine to be higher.
And in the very first deposition that I gave with Chip Nunnally, I gave him the benefit of a book that goes into great detail about how you calculate these increases in vapor pressure and how one chemical can influence the vapor pressure of another.
This is all plain, vanilla science.

0074

Getting into articulating whether one thing replaces another isn't really necessary without the definition of what we mean.
Q Let me ask the question this way: As the ammonia sweeps down the rod and does whatever it does that causes the nicotine to be released, what happens to that ammonia?
A What happens to the ammonia part of it until it is subsequently released? It can be bound in tobacco. Is that what you are referring to?
Q Is it bound in the tobacco?
A Some of it can be.
Q Is it?
A Some of it is.
Q Do you have experimental data that tests that proposition with a lit cigarette?
A Well, I think that is part of the same data we were talking about earlier.
Q Fair enough. The same data we referred to earlier?
A Right.
Q Okay.
A Also, in the recent Coresta paper that was published and in the Labstat with Rickert, there is evidence that you are not recovering all the ammonia

0075

that you are putting in.
Q You are not recovering all the ammonia?
A There is no mass balance work done. In other words, when you burn the cigarettes, there is

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Digitized by the Legacy Industry Documents Library - http://industrydocuments.ucsf.edu/docs/jjxd0001

no ammonia left in the ash, right? So we can state with some fairly high level of certainty that a tiny amount, a very, very minor amount, is left in the ash.

So, therefore, it all left at that point. So somewhere between the time it's originated, say, by the combustion of urea, which is sometime after it's generated, it either ends up in the tobacco temporarily until the tobacco is burned or it exists in the mainstream particulate or gas phase or sidestream particulate or gas phase. We have to deduce from the data where it goes.

Q Are you reasoning from scientific principles that the ammonia displaces nicotine, or do you have some experiment where you can actually see the interaction to the ammonia and the nicotine?

A I think the answer is both, and I think we are also having trouble with "displace."

Q Okay.

A You know, displace isn't necessarily a

0076

bullet in and bullet out thing. If the ammonia causes a localized increase in pH, as I just explained a few minutes ago, it will cause more of the Nicotine to be in the free form and more of it to go into the gas phase.

Therefore, it doesn't replace it -- or displace it one for one; it just creates a change that allows more of it to be in the gas phase.

Q And does any of the ammonia precipitate out?

A Of which?

Q In your theory, does any of the ammonia precipitate out after it sweeps down the rod?

A You mean between the time that it allows the nicotine to leave and before that piece of tobacco is burned? Eventually, that piece of tobacco gets burned, and the ammonia has gone out of it. It's transitory. Is that what you are referring to?

Q Correct.

A A portion of the ammonia can stay in the wet tobacco for a short period of time until the temperature front moving close to it displaces it. It's not going to stay there. It acts in a way to drive out the nicotine and then is driven out.

0077

Q You said "A portion of the ammonia can stay in the wet tobacco." Does it stay in the wet tobacco?

A Most assuredly.

Q How do you know?

A Well, if we look at the number of ammonia molecules that are burned by, say, the amount of urea in tobacco when you burn it and calculate that number, you are going to find it's a very large number, like, trillions.

They are going to be going down the cigarette rods. Some of them are going to be absorbed. We can do a calculation to actually validate that at least one of those molecules doesn't stay there.

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Digitized by the Legacy Industry Documents Library - http://industrydocuments.ucsf.edu/docs/jjxd0001

Q How many of the molecules stay there?
A At least one.
Q Can you be more specific?
A We could calculate what is called a distribution coefficient from scientific principles. If I have ammonia and I have a wet piece of tobacco or a wet piece of paper or wet anything, certainly, a certain percentage of those are going to end up bound to the water that is inside the tobacco.
Q Have you calculated how much of the

0078

ammonia ends up bound to the water inside the tobacco of a lit cigarette?
A Not for that specific case. I have calculated in the past. I mean, ammonia is a chemical. There is many calculations -- and one of which I'm doing right now -- dealing with how much ammonia is bound to various things.
Q But just to make sure I'm clear, have you ever calculated how much ammonia is bound to the wet tobacco in a lit cigarette?
A Without more information I don't think you could do that calculation. You would have to tell me at what time, what position, what temperature, what moisture composition, and all that stuff. I have not done it specifically for that case.
Q When you say "that "case, which case are you referring to?
A Whichever one you were referring to. You are talking about a burning cigarette. With all the possible compositions, no, I haven't.
Q You have not calculated the amount of ammonia that would bind to moist tobacco in a lit cigarette; is that correct?
A That is correct.
Q Sir, the Osdene article does not

0079

necessarily reflect simply Dr. Osdene's work, as I understand it; is that correct?
A Correct.
Q I think you said -- and if I have you wrong, please correct me. My notes may be wrong -- that that was an accurate way of determining nicotine released into the gas phase.
Do I have that correct?
A It's correct. It's a way of determining where the nicotine goes and the four components that we talked about: particulate, gas, mainstream, sidestream.
Q And I think you said -- was it radioactive tracers? Was that the terminology used for the general method that was used in the Osdene article?
A It's not radioactive tracers. Basically, you can take any organic molecule and develop a radioactive form, which doesn't change its chemical properties.
For example, if you grow tobacco in radioactive carbon-14, carbon dioxide, the chemicals that are in that tobacco will be labeled -- a certain percentage of them will be labeled with carbon-14. Therefore, you can determine the phase of those by following the radioactivity.

0080

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Digitized by the Legacy Industry Documents Library - http://industrydocuments.ucsf.edu/docs/jjxd0001

Q All I'm looking for right now is just a label that you and I can use to refer to the technique that was described in Dr. Osdene's article. Just a term that you are comfortable using.

Can I call it radiolabeling for our purposes here?

MS. CHABER: Can I make a suggestion that we find a convenient place to stop and take a break? We've been going over an hour and a half.

MR. LOMBARDI: That's fine. Let's take a break.

(Recess)

BY MR. LOMBARDI:

Q Dr. Farone, before we took the break, we were beginning to discuss the Osdene article that reported on some radiolabeling work.

Do you recall that?

A I do.

Q And without getting into all the details at the moment -- we will get into that in a few more minutes -- the work that you are referring to is work to determine how much nicotine is released from the cigarette?

A It's much more general and broad than

0081

that. It's work that determines the delivery of many different chemicals that are in the cigarette by class.

Q Among them is nicotine?

A Nicotine is among the class of distillables, so-called.

Q Is this what you consider an accurate way of determining the amount of nicotine that comes off of a lit cigarette?

A It's an accurate way. It's not the only way to do it and not only nicotine. Any chemical you can find in a cigarette has been studied this way.

There is a wide body of literature at Philip Morris and other places giving you the scientific background or pedigree for the method. Dr. Robert Jenkins, for example, was the fellow who did most of the work at Philip Morris.

Q And he is actually the person who did the work that Dr. Osdene reports in the article that you have been referring to; is that right?

A Dr. Jenkins did a lot of that work and, I think, Mr. Kuhns. There are some other people involved in that. Bob Jenkins was probably the senior author or senior scientist on 90 percent of

0082

it.

Q And you say this radiolabeling technique is an accurate way of determining the nicotine that comes off the lit cigarette.

What are other accurate ways or other ways do you consider accurate?

A The other ways are by direct chemical measurement and usually by gas chromatography. There are some liquid chromatography methods. There are colorimetric methods. There are a wide variety of methods for the determination of alkaloids.

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Digitized by the Legacy Industry Documents Library - http://industrydocuments.ucsf.edu/docs/jjxd0001

Q Okay. But you consider the radiolabel technique reported on by Dr. Osdene in this article as an accurate way of measuring the nicotine that comes off a lit cigarette?
A Correct.
Q And I think you testified that based on Dr. Osdene's article, you can say that 12 percent of the nicotine that comes off a lit cigarette is in the mainstream gas phase; is that correct?
A That's correct.
Q Do you have an understanding that when a scientist in this context refers to vapor phase, that that is the same thing as gas phase?
A They are usually used synonymously.

0083

Again, you have to be careful of context.
Q Okay. Now, why do you consider the radiolabel technique as an accurate measure of the nicotine that comes off a lit cigarette?
A Well, with regard to nicotine, if you look at methods for measuring, you will find in the literature -- and I think it's referred to, if I recall correctly, by Dr. Osdene in the paper -- the correlation of that method with other methods.
One of the nice things about the radiolabel is that it can account for all of it. One way to get in trouble in science is to only account for a fraction of what you are measuring, which then you have no way of knowing whether you are right or not.
In other words, for example, if somebody tells me there is less than one percent nicotine in the gas phase, I would say, "Okay. Let's add it all up. How much nicotine did you start up with?"
If a method does not account for all of the nicotine, then we can say it's not scientifically accurate because it's only measuring one. And you could be wrong and not know it because you are not doing a mass balance.
So the method developed by Dr. Jenkins, as

0084

written by Dr. Osdene, is unique in its analysis of smoke because it allows you to account for it all. Any method that does not account for all of it is subject to a high rate of error.
Q Okay. And is the essential way this technique works is to have a radioactive label on the nicotine before the cigarette is smoked and then smoke the cigarette and check where all the various forms of smoke go and determine how much of the label is in each of those locations? Is that the general way it works?
A That's the general idea, yes.
Q And so when you have, for instance, the nicotine that has gone into the mainstream gas phase and you go to where that is, you use a Geiger counter or something similar to determine how much of the radioactive label is in there?
A Not Geiger counter, but something similar. That is the right idea.
Q What would you use?
A There is various kinds of counters that you can use. Geiger Muller is a particular kind of

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Courtesy of the Legacy Tobacco Documents Library (LTDL) at the University of California, San Francisco (UCSF) http://industrydocuments.ucsf.edu/docs/jjxd0001

counter.
Q What it's actually counting is the radioactive label, and from the radioactive label,

0085

you determine how much of the nicotine is in that particular phase; is that right?
A That's correct.
Q Okay. And is the radioactive label attached to a particular atom of the nicotine model?
A It can be depending on whether it's synthesized or grown. If I recall correctly, they actually determine where the label is for most of it. Nicotine has many carbon atoms, and any one of which could be labeled with C-14, which is the isotope which is radioactive. But there were certain ones that were more likely to be labeled than others.
Q Do you know where the label was attached in the work reported by Dr. Osdene?
A Not without looking it up.
Q Dr. Farone, I'm showing you what has been marked as Farone Exhibit 3.
(Defendants' Exhibit 3 was marked for identification, the original of which is attached hereto.)
BY MR. LOMBARDI:
Q On the front page you see "Contents," and the fourth one from the top is an article by Thomas S. Osdene; is that correct?

0086

A That is correct.
Q And then is that article then copied beginning on the next page of the exhibit?
A That is correct.
Q Is this the article that you have been referring to as showing the radiolabeling technique for measuring the nicotine that comes off a lit cigarette?
A Yes. And this article summarizes all of the previous work of Dr. Jenkins and others; some of which is recorded in the references on page 59 of this article.
Q Okay. And is it true that the experimental results that Dr. Jenkins and others at Philip Morris obtained are in a table on page 56 of the document?
A Well, the experimental results that Dr. Osdene selected to use in this particular paper.
Q Fair enough. And looking at that table, it has a title, doesn't it?
A Yes.
Q Okay. Looking at that title, can you tell where the radiolabel is attached to the nicotine for the results reported in that table?
A No, it does not say. It says, "Percent

0087

Distribution of Radioactivity from Carbon-14-labeled Cigarette Distillables into Whole Smoke."
Q Okay. Does the carbon-14 label provide you with any information on where it's attached to the nicotine molecule?
A No. I think it does say somewhere in the article, though. Can I check it?

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Courtesy of the Legacy Tobacco Documents Library http://tobaccodocuments.ucsf.edu/docs/jjxd0001

Q Yes, please.
A I'm looking for any discussion of the analysis of the chemicals themselves. It may not have been put in here.
Q You know, Doctor, let me just ask you one question before you continue. It may not be worth the effort to look through the entire article.
Is it the case that wherever specifically the radiolabel is attached to the nicotine molecule that it will be at an atom as opposed to somehow attached to the entire molecule?
A Well, the carbon-14 is an atom, and it's made up of atoms. All we are doing is replacing one of the carbon atoms with carbon-14. There is a very minor change. There is no change in the chemistry of the material, but it does allow you to determine where that material goes.
Q You don't need to look further. I think

0088

that answers my question.
In looking at Table VIII, is that where you -- is that one place you draw the information necessary to conclude that there is 12 percent of the nicotine in the mainstream gas phase?
A That is correct. If you look at the compound nicotine, you will see 3.0 percent was in the gas phase, 21.2 is in TPM, total particulate material. If we take three and divide it by the sum, you get a number that is approximately 12.9 or 12.8 percent.
Q That is how you come to the conclusion there is 12 percent of nicotine in the gas phase of mainstream smoke?
A Correct.
Q Sir, is it true that that table actually shows a measurement for the amount of radioactive carbon-14-labeled material that is in the gas phase of mainstream smoke?
A That is correct.
Q So what it is actually measuring is the radioactivity, the actual carbon-14 that is in the gas phase; is that right?
A That is what it is measuring, but the method has been previously checked to determine how

0089

much of the nicotine or any of these compounds are unchanged. And Dr. Osdene refers to that in the paper.
Q Okay. But just so I understand, when we are doing the measurement that we are talking about in Table VIII, we are not literally measuring nicotine; we are measuring the carbon-14 label that has come to the gas phase?
A We are measuring, according to this paper, 95 percent or more of the nicotine.
Q Okay. But according to Table VIII, what you are literally measuring is the amount of the radiolabel that makes it to the various forms of -- the various phases of smoke; is that right?
A I don't understand the question. Whenever you measure anything in science, you never literally measure it. In other words, if you use a gas chromatograph to measure nicotine, all I'm saying is

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Digitized by the Legacy Industry Documents Library - http://industrydocuments.ucsf.edu/docs/jjxd0001

that whatever comes out after I inject my sample I'm going to call nicotine. You have no guarantee it's actually nicotine.

Whenever you measure or whatever you measure, in any of these methods, all methods only measure some trace of the chemical. But because it has been shown that it doesn't degrade into other

0090

things, we can say this one is probably more accurate for saying it's nicotine than, say, a gas chromatograph or liquid chromatograph.

Q How was it shown the nicotine didn't degrade into other things?

A That is referenced in the Houseman paper. Also, Bob Jenkins did work on that. You analyze chemically the nicotine before and after heating it to show it doesn't degrade the radioactive nicotine, so you can account for the nicotine in the sense of any of the other measurements that you make.

Q Okay. And Houseman did that -- I think you have turned to the page before the table in the article, page 55 of the article; is that right?

A Houseman did it, but I also believe -- well, I recall that Bob Jenkins also did it. This kind of work was also validated at Philip Morris.

It was nice to refer to an outside peer review paper, which is what Dr. Osdene did, but I'm quite sure I recall discussions of this and Dr. Jenkins' papers, both internal and possibly some of the published ones, where he also did that experiment.

Q And you are talking about the experiment to determine whether nicotine degrades as it goes

0091

into the gas phase?

A When you heat it up, to make sure that only a small percentage is changed to something else, we can say that, yes, this is nicotine that I'm measuring and not some other degradation products of nicotine.

Q If the nicotine did degrade going into the gas phase, then Table VIII would not necessarily be reflective of the amount of nicotine that went into the various phases of mainstream and sidestream smoke; is that correct?

A Probably even more severe than that. If the nicotine degrades into something else and it's a class of what we call distillables, then probably all the conclusions that have been reached in any of the litigation that the additives to cigarettes are unchanged and the flavor additives would also be in question.

Q Well, let's talk about nicotine. That is what we are talking about now.

If the nicotine degrades going into the gas phase, is it the case that you are not necessarily measuring the amount of nicotine that goes into the gas phase in the measurements that are done in Table VIII?

0092

A That would be the case.

Q Okay. It could be that you are measuring simply degradation products of nicotine that have

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Digitized by the Legacy Industry Documents Library - http://industrydocuments.ucsf.edu/docs/jjxd0001

the radioactive label attached to them; is that correct?
A Correct.
Q Okay. Now, based on my understanding, you are referring to other work done by Dr. Jenkins also as part of your testimony here. But just based on Table VIII for the moment --
A Yes.
Q -- is there any indication that in Table VIII the work was done to determine whether nicotine degrades on moving into the gas phase?
A In the table itself?
Q Right.
A Literally? No.
Q Is there any indication in the text referring to Table VIII starting on page 55 and moving over to page 56 that work on the degradation, or lack thereof, of nicotine as it moves into the gas phase was done?
A Yes, sir.
Q Where is that?
A Not only nicotine, but as I was indicating

0093

a few moments ago, all distillables.
Q Show me.
A It says, "Nicotine is probably the most thoroughly investigated distillable tobacco component in precursor-product studies involving the distribution of radioactivity into whole smoke. The radioactive content of mainstream smoke from cigarettes containing C-14 nicotine has been shown by Houseman to be composed of 98 percent-plus of unchanged, distilled nicotine, with the remaining activity being found in lightweight combustion/pyrolysis products."
And it goes on to point out that this is true of menthol and menthane and menthone and dotriacontane. The next page continues this discussion, which has been relied on quite heavily in making the statements that things added to cigarettes distill unchanged as opposed to turning into degradation products.
Q That would vary based on the particular additive or nicotine. It's not necessarily going to be the same answer on whether there is degradation for everything you put into the tobacco; is that right?

0094

A Not exactly the same. For example, if menthol didn't distill like it says here, 98.9 percent, then one would really have to be concerned about what toxic or carcinogenic degradation products of menthol there might be.
As I understand from opinions provided in other cases, the industry's position has been that the stuff all distills and so, therefore, there is no concern or no need to worry about the degradation products.
In the case of nicotine, we know that the five percent that does change can lead to some pretty nasty things. We are trying to grasp whether or not the amount of gas phase is 12 percent or one

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Digitized by the Legacy Industry Documents Library - http://industrydocuments.ucsf.edu/docs/jjxd0001

percent or a tenth of a percent. We are trying to get an order of magnitude as to what this is.

Q Let's stick with nicotine for right now. We can come to the others later if we have time.

As I understand the sentence you were pointing to to establish that the study of whether nicotine does or does not degrade as it moves into the gas phase is that second sentence in the last paragraph of page 55; is that right?

A For this paper?

Q Yes.

0095

A Yes.

Q And it's the Houseman work, in particular?

A Yes.

Q Have you read that Houseman article?

A A long time ago.

Q Okay. Did the Houseman article do a study of whether the degradation -- strike the question.

Do you recall if the Houseman study determined whether nicotine degrades on moving into the gas phase?

MR. BROWN: You are referring to what he published as opposed to maybe a broader study he did?

MR. LOMBARDI: I'm referencing the Houseman article Dr. Farone referred to.

THE WITNESS: I don't recall because it was a long time ago. But in reading this document, as I indicated earlier, there is also the work done by Jenkins to validate that. I don't recall which ones do exactly what.

BY MR. LOMBARDI:

Q You don't recall right now whether the Houseman article made a study of whether degradation occurs in nicotine going from the cigarette to the gas phase?

0096

A No, other than what is in evidence and what it says here of five percent.

MR. LOMBARDI: Let's get the Houseman article.

(Defendants' Exhibit 4 was marked for identification, the original of which is attached hereto.)

BY MR. LOMBARDI:

Q Showing you what has been marked as Exhibit 4, do you see that is an article written by T.H. Houseman titled "Studies of Cigarette Smoke Transfer Using Radioisotopically Labelled Constituents," with a date of November 1973 at the top?

A I see that.

Q Okay. Is this the Houseman article we've been discussing?

A I believe it is.

Q Okay. And you are welcome to look at what you would like to, Dr. Farone. Let me initially refer you to Table 1 on, I think, the next to the last page of the exhibit.

Do you see Table 1?

A I see it.

Q As you understand it, Dr. Houseman, in this article, is reporting on research to determine

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Courtesy of the Legacy Tobacco Documents Library (LTDL) at the University of California, San Francisco (UCSF) http://industrydocuments.ucsf.edu/docs/jjxd0001

0097
where radioactive labeled nicotine winds up in the smoke; is that correct?
A No.
Q Okay. What is your understanding?
A My understanding is that the only part of this that Dr. Osdene and Dr. Jenkins are referring to is the issue of whether or not it's unchanged, not where it ends up.
Q Okay.
A With this paper, Dr. Osdene and Dr. Jenkins, they were interested in where it ends up. They weren't relying on Dr. Houseman. They didn't reference it for that purpose. They were just referencing it to show that the radioactivity came from nicotine and not from something else.
Q Okay. Does Dr. Houseman also show -- strike the question.
Whatever Dr. Osdene and Dr. Jenkins were talking about, does Dr. Houseman purport to show where nicotine, among other things, winds up in the smoke?
A It does. It talks about phase of smoke.
Q And does he use a radiolabel technique for that?
A Yes, he does.
0098
Q And, in fact, does he use the same one we talked about earlier as the radiolabel?
A Yes, he does.
Q Does he also determine whether nicotine degrades as it goes into the gas phase?
A I think that is just -- I think this is the general gist of Table 2.
Q Sir, are you still reading? I don't want to interrupt you.
A I'm not reading. I was just looking to see exactly where the statement was, and I think I found it.
Q Okay. Let me refer you to Table 1 briefly before we go back there. In Table 1, am I right where it says "Total 14C-activity" and there is two columns under that in Table 1? Do you see that?
A Let's see.
MR. BROWN: Do you see that?
THE WITNESS: I see it. I see "C-activity." I don't see C14.
MR. LOMBARDI: 14C is actually how it appears.
MR. BROWN: Oh, okay. The copy is not that great.
BY MR. LOMBARDI:
Q And under "Total 14C-activity," are there
0099
various measurements related to the amount of radiolabel material detected in certain phases of smoke?
A There is.
Q And it goes through various phases such as the mainstream total particulate matter, mainstream vapor, and it goes on from there; is that right?
A Correct.
Q Now, does it show how much of the radioactive label material was detected in the

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Digitized by the Legacy Industry Documents Library - http://industrydocuments.ucsf.edu/docs/jjxd0001

mainstream vapor?
A It does.
Q And you understand that to mean the same thing as the mainstream gas phase; is that correct?
A That's correct.
Q And how much does it show?
A 4.1.
Q Okay. The 4.1, what is the unit of measurement as you understand it there?
A Percent, it says.
Q Okay. But a percent of what?
A Of C-14 activity.
Q So is this his attempt to put together 100 percent -- as you indicated to us earlier, you try and locate 100 percent of the label?

A Yes. And as you can see from the table, he has accounted for 97.1 percent, so he lost approximately 2.9 percent of his activity.
Q Now, the part of the table with the column that says "14C-Alkaloids," do you see that?
A Yes, I do.
Q What does that measure, as you understand it, or what information is set forth there?
A Well, they are a super class that includes nicotine, but it isn't necessarily limited to nicotine.
Q How would you determine as a scientist, Doctor -- I think you said you could use gas chromatography to determine whether there were alkaloids in the gas phase; is that right?
A Well, yes, with the same limitations that you do for radioactivity.
Q Okay.
A In other words, you have two problems. Number 1 is when you collected the gas phase, okay, because it's an allusive kind of thing. The second is when you go ahead and measure it, whether or not the peak you see is the correct material, and if you don't see a peak, it's whether your instrument wasn't sensitive enough. So there is all those

variables that enter into the measurement.
Q I presume it's Dr. Houseman. Do you know what technique he used for determining the alkaloids in the various phases of smoke for purposes of Table 1?
A It appears from the article between Table 1 and Table 2 he talks about gas chromatographic and spectroscopic methods.
Q Are those recognized methods for making the determination of things like alkaloids in the gas phase?
A No. Wait a minute. He is not determining it in the gas phase. He has only done the correlation on the TPM mainstream and sidestream when you read what it says.
Q I'm sorry. You have to give me an identification of where you are. I'm sorry.
A It's the second paragraph on the left-hand column. Okay.
"Excellent agreement was obtained between the gas-chromatographic and spectroscopic

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Courtesy of http://industrydocuments.ucsf.edu/docs/jjxd0001

methods used for determining nicotine in mainstream and sidestream TPM and the butt."

In other words, he didn't actually measure the nicotine in the gas phase of the vapor.

Q Are you sure about that?

A I'm reading what it says there.

Q And you take that to mean he did no measurement of the gas phase?

A I haven't read the rest of the paper.

Q But you take that to mean --

MR. BROWN: By "that," you mean what he just read?

THE WITNESS: Correct. What I just read does not say he measured the gas phase.

BY MR. LOMBARDI:

Q In the chart, what does he say as far as the amount of actual nicotine measured in the gas phase?

A He says zero, but that could be not applicable.

Q Does he say it's not applicable?

A No, but he doesn't tell you in the article that he actually measured it.

Q Okay. But you see in the chart if you look under that, there is a line for butt in the chart.

A Yes.

Q Do you see there is some dashes in that line?

A Uh-huh.

Q What do you take a dash to mean?

A There is no nicotine in the butt.

Q Could it mean he didn't do a measurement?

A No. It might mean it's not applicable to the butt.

Q Okay. And he didn't do a measurement?

A Well, I don't know that he did or didn't do a measurement in the butt. All I know is what he tells us. He doesn't tell us he measured the butt, and he doesn't tell us he measured the gas phase.

Q My only question is, sir, when you read zero under mainstream vapor for 14C, dash, alkaloids, you take that as meaning he did no measurement of nicotine in the gas phase; is that correct?

A When I saw the zero, the question is did he or did he not. In other words, his results for activity are consistent. He makes the statement, as Dr. Osdene and Dr. Jenkins and people who look at this, that the key here is the correlation between the 14.1 and the 15.4 having to do with the percentages that you find in the mainstream TPM and in the sidestream TPM.

It's my opinion, based on this paper, you could not rely on this paper for any determination of gas phase. If you could, they would have referenced that in their paper. That is the new thing that they did. They actually measured all four.

Q And your opinion that you can't determine

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Digitized by the Legacy Industry Documents Library - http://industrydocuments.ucsf.edu/docs/jjxd0001

how much nicotine is in the gas phase from this paper is based on the fact that under mainstream vapor for 14C alkaloids the number zero appears?

A Well, you don't know what the zero means.

Q You don't know what the zero means?

A If the number zero was the result of an experiment, it would have to be given with a level of precision. There would have to be some precision associated with that. I see no reference to any gas phase measurement.

Q Let me ask you a question, and just make an assumption for me just so I can understand.

If you assume that he did a measurement of mainstream vapor and came up with zero under the 14C alkaloid section, that would mean that he found no nicotine in the gas phase; is that right?

A If he had made a measurement and if it was zero, then yes, I can agree with that.

Q Then in making my assumptions -- and I

0105

understand you don't agree with my assumptions -- making my assumptions, that would mean there is actually, according to these tests, no nicotine in the gas phase?

A No.

Q What would that mean?

A It would mean his method -- that he probably didn't have the sensitivity, unless you are going to say that nicotine degrades into something else and the something else shows up in the vapor phase. So none of the degradation products of nicotine show up in the vapor phase in order for that zero to be true.

Q Making my assumption about the zero under the 14C, dash, alkaloid, doesn't it mean that only degradation products of nicotine make it to the vapor phase?

A No. But he --

Q You keep pointing there.

A I'm pointing to the last column.

Here is my point: Maybe it isn't clear. We know that there are certain products that contain nicotine that are formed in cigarettes that end up in the gas phase. Those have been reported widely by the industry.

0106

There is going to be a certain amount of radioactivity that started out in there that ends up in there and ends up in the NNK. And when you went ahead and measured nicotine or total alkaloids, you should find cotinine and you should find other things in the TPM.

The fact that it's zero tells me either he didn't do it or the technique is totally insensitive. In the hypothesis that you are presenting, if you asked me to accept it as correct, I would have expected a number like 0.1 or 0.001 or some product of these other materials we know exist in the gas phase. You should see a certain amount of nicotine or cotinine.

Q The zero in the 14C alkaloids column, making my assumption that a measurement was done, that zero indicates that there was no nicotine in

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Courtesy of http://industrydocuments.ucsf.edu/docs/jjxd0001

the gas phase, not that there wasn't degradation product of nicotine in the gas phase; isn't that correct?

A It says, "as a percent of original contained in tobacco burnt."

Q Sir, isn't the total 14C activity column the column where you measure radioactivity?

A Yes.

Q And the 14C alkaloid column is where a determination is made of what the actual components of the gas phase are and whether they contain alkaloids; isn't that right?

A No. If you look at the total activity in this column, it says there is 70.4 percent of the activity that has been recovered. If you look at C14 activity, it says 97.1 percent of the total stuff is recovered.

Now, you have to ask yourself what is the relationship between those two numbers. It's only about 70 percent, right? 70.4 is about 70 percent of 97.1. So there would be no excellent agreement if that would be off by 30 percent.

If the interpretation of these numbers is correct, there would be 30 percent degradation of nicotine to other products. Is that what you would like me to believe? If you make the assumption that that is happening, then it would be 30 percent degradation of nicotine to other things.

Q Sir, it's your testimony, not mine.

MS. CHABER: It's your hypothesis, though, Counsel.

BY MR. LOMBARDI:

Q Go ahead.

A My testimony is you can't draw that conclusion from this paper.

Q At least we can agree to what is written under mainstream vapor that states the amount of alkaloids found in various phases, that there is a zero in that column for mainstream vapor; is that right?

A We can agree with that.

Q Let me ask you to refer to the prior page under Figure 4. Do you see "Results and Discussion"?

A Yes.

MR. BROWN: Prior to that page or further?

MR. LOMBARDI: Prior page.

BY MR. LOMBARDI:

Q Do you see under "Results and discussion," second paragraph, quote, "In the present transfer studies, nicotine was found only in the particulate phase of smoke"?

A Right.

Q Do you see that?

A I do.

Q What do you understand that to mean, sir?

A What it says, that he measured that and that goes along with these numbers that are in Table 1.

Q It says he found nicotine only in the

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Digitized by the Legacy Industry Documents Library - http://industrydocuments.ucsf.edu/docs/jjxd0001

particulate phase, doesn't it, sir?
A It says that.
Q It doesn't say he didn't measure for nicotine in the gas phase, does it?
A As a result, you have to --
Q Answer my question.
MR. BROWN: I'm going to object. It's argumentative, and the paper says exactly what it says.
MR. LOMBARDI: That is absolutely right. Will you stipulate to that?
MR. BROWN: I can stipulate you can torture it or accurately refer to it. That will be up to a jury to decide whether you are torturing or accurately describing it.
THE WITNESS: Okay. What is the question?
BY MR. LOMBARDI:
Q Okay. Sir, have you continued your research on how much nicotine makes it into the gas phase since you left Philip Morris?
A Yes.
Q Okay. Have you found any other articles other than the Jenkins article which we'll get to --

0110

have you found any other articles beyond Houseman and Jenkins that support your theory that 12 percent of the nicotine gets into the gas phase using a radiolabel technique?
A Any openly published articles, you mean?
Q Right.
A No, I have not.
Q Have you looked for that kind of article?
A I think I did a -- yes, I've done literature searches.
Q It would be important for an expert to keep up to date on developments in this type of area?
A Correct.
Q Particularly if that expert was going to express an opinion that 12 percent of the nicotine is in the gas phase based on radiolabel work; isn't that right?
A Yes.
Q Dr. Farone, I've handed you what has been marked as Farone Exhibit 5, which is titled "GC-AED Studies of Nicotine Fate in a Burning Cigarette."
Do you see that?
A Yes.
(Defendants' Exhibit 5 was marked for

0111

identification, the original of which is attached hereto.)
BY MR. LOMBARDI:
Q Have you seen this article before?
A I'm aware of it through "Analytical Chemistry." I have seen it. I have not studied it in detail.
Q Without looking at it, sir, are you familiar with the conclusions of the article -- let me just state more generally, are you familiar with the work done in the article?
A Yes.
Q What type of work is reflected in the

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Courtesy of the Legacy Tobacco Documents Library at industrydocuments.ucsf.edu/docs/jjxd0001

article?
A This has to do with gas chromatographic study of nicotine measurements.
Q And is there also a measurement made of the gas phase of -- strike the question.
Is there a measurement made of nicotine in the various phases?
A Yes.
Q Okay. And do they use a radiolabel technique or something similar to that?
A Something similar. I think, if I recall, this is deuterium, so it's a deuterium detection

0112

which would be by MMR -- or let's see what they call it, AED. It's a detector.
Q If you are looking for AED, it's at the top of the first page the, first line of the abstract.
A Yes, emission detector for the deuterium labeling.
Q Do you see in that same sentence that you just pointed to, the first sentence of the abstract, it says that an AED "can be used to selectively detect compounds labeled with stable isotopes, such as D, 13C, and 15N."
Does the "D" refer to deuterium, as you understand it?
A Yes.
Q And is deuterium a radioactive element?
A No. No.
Q Okay. Is deuterium something that can be detected? Strike the question.
Radiolabels can be detected by various methods of determining if there is radioactivity in a substance, correct?
A That's correct.
Q Is there a way of detecting deuterium?
A Yes. If you have an isotope which is

0113

different than the normal distribution of isotopes, then you can detect it usually by various forms of spectroscopy. It's different than looking at its radioactive decay.
Q Sir, from your previous review of the article, are you able to say whether a determination was made of the amount of nicotine that appears in the gas phase of smoke?
A Well, if you look at Table 1, which is probably the only one that I have looked at, if you look at Table 1 on page 2183, you can see that they recovered 94.9 to 93.2 percent of the radiolabel material and that they have a different distribution of mainstream particulate, sidestream vapor, and sidestream particulate.
So if we go along with this -- and I haven't read the article in detail -- but they are essentially saying they did not measure any in the mainstream vapor phase.
Q They don't exactly say they did not measure, do they, Doctor?
MR. BROWN: I'm going to object to that as argumentative. Also, ambiguous and vague.
BY MR. LOMBARDI:

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Digitized by Industry Documents Library - http://industrydocuments.ucsf.edu/docs/jjxd0001

Q Is it your testimony the article says they
0114
do not measure nicotine in the gas phase?
A It says they did not measure. They did not report in Table 1 any value for the mainstream vapor phase. No matter how small, they didn't put 0.0 or 0.10 or point whatever.
Q Did you read the footnotes to that table?
A Yes.
Q Do you see footnote "E"? I think it's a "C." It's the second to the last.
MS. CHABER: You mean the part you have underlined?
BY MR. LOMBARDI:
Q "No compounds containing D were detected in the mainstream vapor phase or in the ashes."
Do you see that?
A I see that.
Q What it says, if you take it literally, they did not detect anything in the mainstream vapor phase; is that right?
A That's correct. And that is totally not credible.
Q Is this is an incredible article?
A Yes, because in that Table 1, if you are doing what they are saying, it's that they saw none, zero.
0115
Q Okay.
A Okay. And in the experiments that have been previously reported, we have seen some. In the Coresta presentation made by the Philip Morris people, they saw some. They saw one percent. This work sponsored by R.J. Reynolds shows none.
Q Okay.
A Now, if their technique was sensitive enough and if their technique was to be credible, you would anticipate seeing a tenth or two-tenths or some very small amount. The fact it's none makes it very suspicious to me.
Q And this was published in -- is it the "Annals of Chemistry"?
A The journal is called "Analytical Chemistry."
Q That is a journal that you take or subscribe to?
A I don't take it, but I have access to it.
Q Is it one of the journals that chemists read?
A Yeah. It's one of the journals in which analytical chemical studies are frequently submitted.
Q Is it a peer review journal?
0116
A Sometimes.
Q Do you know if this article was peer reviewed?
A No, I don't.
Q Can you tell one way or the other based on looking at the article whether it was peer reviewed?
A No. Frequently the editors will accept articles without peer review. It says "Received for review January 19, 1999," but it's accepted on March

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Digitized by the Legacy Industry Documents Library - http://industrydocuments.ucsf.edu/docs/jjxd0001

23rd. It doesn't tell you whether they actually sent it out for review.

Q Scientific journals typically don't say they sent it out for review by peer reviewers on the face of the article?

A No, you can't tell.

Q So it's at least possible this has been peer reviewed; is that right?

A Yes.

Q It certainly was published?

A Correct.

Q Whatever you may believe about the quality of work here, the scientists here did experiments and reported those experiments in a public place; is that correct?

A That is correct.

0117

Q So that others like yourself could look at the work and do criticisms of it; is that correct?

A That is correct.

Q Have you published a similar article based on your own experimental work showing how much nicotine is in the gas phase of cigarette mainstream smoke?

A Because of --

Q Can you answer that question?

MR. BROWN: He can't answer because you won't let him.

BY MR. LOMBARDI:

Q Why can't you answer the question?

A I didn't say I can't answer the question.

MR. BROWN: Let's have the question read back.

MR. LOMBARDI: I can rephrase it.

MS. CHABER: The question was asked and answered.

MR. LOMBARDI: He said no, I thought, but maybe I got that wrong. I want to make sure.

BY MR. LOMBARDI:

Q I'll rephrase the question for you.

Have you had an article, based on your own experimental work, published in peer review literature that sets forth your theory with

0118

experimental testing backing it up that 12 percent of nicotine is in the gas phase of mainstream smoke?

A No.

Q Okay. Because I promised I would, Doctor, I'm going to show you a couple of articles by Dr. Jenkins.

I'm showing you what has been marked as Exhibit 6, Dr. Farone, which on the title page says, quote, "The Use of Carbon-14 Labelled Compounds in Smoke Precursor Studies - A Review," closed quote, by Jenkins and others.

Do you see that?

A I do.

(Defendants' Exhibit 6 was marked for identification, the original of which is attached hereto.)

BY MR. LOMBARDI:

Q Okay. Is this an article that you are familiar with that was written by Jenkins and others at Philip Morris?

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Digitized by the Legacy Industry Documents Library - http://industrydocuments.ucsf.edu/docs/jjxd0001

A Yes. I'm more familiar with the internal documents that lead up to this, but I've seen this before.
Q Okay.
MS. CHABER: Does this have a date somewhere

0119

because I'm not seeing it?
MR. LOMBARDI: I can't tell you.
MS. CHABER: Okay.
MR. LOMBARDI: All I know is what is on the face of the document.
BY MR. LOMBARDI:
Q Dr. Farone, if you refer to page 24 --
MS. CHABER: I just want to understand. Is this some document you are producing that has been published somewhere in the literature, or is this something within Philip Morris? I'm just trying to understand.
MR. LOMBARDI: I'll ask the doctor that. I don't know myself. And what I would say doesn't matter anyhow.
MS. CHABER: Well, it does. You presented a document, and I certainly think your representations with respect to what the document is and where it came from does matter.
MR. LOMBARDI: I'm not going to make a representation whether it was published or wasn't published.
THE WITNESS: What I did while you were discussing that was to look at the references on the back of the Osdene paper to see if, in fact, this is

0120

one of the documents cited by Osdene. It doesn't appear to be.
And this has three authors, Jenkins, Comes, and Bass, which do not correspond with any of the papers published by Robert Jenkins and others that are referenced in the Osdene paper.
BY MR. LOMBARDI:
Q Do you see one in the Osdene paper, while you are there, authored by Jenkins, Chavis, Newman, and Morrell?
A I believe I did. Let's see.
Q Is that titled "The Quantitative Recovery of Smoke from Radioactively Labeled Cigarettes"?
A Yes. It's not labeled anything in this.
Q There is no title?
A No. It has a citation.
Q Is it the "International Journal of Applied Radiation and Isotopes"?
A Correct. Volume 22, 1971.
Q Pages 691 through --
A It starts 691.
Q Showing you what has been marked Farone Exhibit 7, Doctor, does that appear to be the article that you refer to as being cited in the Osdene article that has been marked as Farone

0121

Exhibit 3?
A It appears to be.
(Defendants' Exhibit 7 was marked for identification, the original of which is attached hereto.)

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Digitized by the Legacy Industry Documents Library - http://industrydocuments.ucsf.edu/docs/jjxd0001

BY MR. LOMBARDI:
Q Okay. And so this is an article in which Dr. Jenkins and others from Philip Morris published information on recovering radioactively labeled elements from cigarettes; is that right?
A Yes.
Q Then this work was done prior to the time you arrived at Philip Morris?
A All of it.
Q When you say "all of it," are you referring to just Exhibit 6 -- I'm sorry -- Exhibit 7?
A Well, I was going back the Osdene paper published in '75, and I didn't arrive there until '76.
Q So when you say "all of it," you are referring to the Osdene paper and the Jenkins paper marked as Exhibit 7?
A Correct.
Q Okay. And I think the easiest way to do

0122

this might be to refer to the abstract at the beginning of the article.
Do you see that?
A Yes.
MS. CHABER: In which language?
MR. LOMBARDI: There is only one I can read, so we will stay with English for my purposes.
BY MR. LOMBARDI:
Q Doctor, I know you read other languages.
Does that indicate that Dr. Jenkins and others are performing the carbon-14 label experiments that you described for us before?
A Yes.
Q Okay. Dr. Farone, you made reference earlier to a patent by Cliff Lilly -- and I'm just trying to be inclusive here -- that supports what we have called in this deposition the nicotine displacement theory.
Do you recall that?
A Yes.
Q Okay. I want to see if I have the right patent here. I'll hand you that. Dr. Farone, you will see that Exhibit 8 is not in the traditional form of a published patent, correct?
A That is correct.

0123

(Defendants' Exhibit 8 was marked for identification, the original of which is attached hereto.)
BY MR. LOMBARDI:
Q I'll represent to you that we took it off line. Have you seen patents in the format where they have been taken from computer databases?
A Well, I mean the ones I'm familiar with you get the patent directly from the U.S. patent office. It's very simple.
Q Well, sir, have you seen it in this format?
A This format, no.
Q Do you see it does have a reference to a patent number at the top, patent number 4,607,646.
A That's correct.

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Courtesy of the Legacy Tobacco Documents Library (LTDL) at industrydocuments.ucsf.edu/docs/jjxd0001

Q And with the date of August 26th of '86?
A Right.
Q And you can see a little bit farther down it says "Inventor: Lilly," referring to Cliff Lilly, correct?
A That's correct.
Q And two others at Philip Morris; is that correct?
A Yes.

Q And I guess if I direct your attention to the second page of the document I've handled you, there is at the bottom half of the page the letters "SUM," s-u-m, do you see that?
A Yes.
Q I believe you will find a summary of the invention. My question to you simply is, is this the patent that you were referring to when you said that it supports your nicotine displacement theory?
MS. CHABER: Not necessarily in this format since I note on the first page it says, "This certificate also contains corrections to data that is not reproducable in LEXPAT."
MR. LOMBARDI: That's fine. I don't know what date this is corrected. I'm just asking a question whether this is a patent that he has seen.
MS. CHABER: You just mean in general as opposed to any of the data that may be here and/or correct?
MR. LOMBARDI: That's absolutely correct.
MS. CHABER: I just want to be clear.
BY MR. LOMBARDI:
Q With all that, is this the invention you were referring to?
A Yes.

Q Okay. And the invention here is an invention related to replacing Burley with cured Bright tobacco.
Is that a general description?
A That is correct.
Q And your understanding was that ammonia was used in that process?
A That is correct?
Q Okay. What aspect of this invention supports your nicotine displacement theory?
A Well, if you recall, we were discussing those pieces of it that were publicly available other than internally contained documents.
If you read the second paragraph under "Summary," it uses a lot of the buzz words that we've discussed this morning. "Ammonia treatment of tobacco has been employed in the past, principally as a means to displace and effect release of nicotine."
This is what they call a description of the prior art. It is used to alert the examiner and other people as to what is generally recognized as being scientifically accepted. If it wasn't scientifically accepted, you wouldn't have to call it prior art.

So this shows that the general background

http://legacy.library.ucsf.edu/tid/otn05a00/pdf
Digitized by the Legacy Industry Documents Library - http://industrydocuments.ucsf.edu/docs/jjxd0001

of the science in this area is, that ammonia when impinged upon tobacco, has the result of displacing and effecting the release of nicotine. It's that simple.

Q Okay. Is that the part of this patent that you point to as supporting the nicotine displacement theory, as we called it in this deposition?

A Yes. And it's a very important part because you are obligated under the law to truthfully explain the prior art. So if there was disagreement by people at Philip Morris, this statement shouldn't be in here.

Q Okay. So your testimony is that this paragraph is right under the heading "Background of the Invention"?

A Yes, it is.

Q And it's the first paragraph there?

A Yes.

Q What they describe in that first paragraph there or they refer to is various denicotinization processes?

A That is correct.

Q Those are processes for removing nicotine

0127

from tobacco; is that right?

A That's correct.

Q And some of those processes were used in, I think, the fifties and sixties to try to create a denicotinized cigarette?

A Not only try, we did.

Q You are correct. And King Sano did, too?

A That's right.

Q Did they use an ammonia process?

A I don't recall exactly.

Q Okay. And it was not a secret in the scientific world that ammonia could be used in the denicotinization process back at the time you were at Philip Morris?

A It's not a secret. We knew ammonia swept through nicotine removes nicotine.

Q And actually Philip Morris in this patent publicly stated tobacco could be used in the denicotinization process?

A That's correct.

Q When you are denicotinizing nicotine, do you use a lit cigarette?

A Do I?

Q Does anybody that you know of?

A At Philip Morris, yes. Everybody smokes

0128

all over so the people --

Q When you are trying to produce a denicotinization cigarette, do you use a lit cigarette to do so?

A No, you don't.

Q What you do actually is you take tobacco and you treat the tobacco and then you take the treated tobacco and put it into various cigarettes; is that right?

A That is correct.

Q And that is true when you are denicotinizing a cigarette with ammonia; is that

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Courtesy of http://industrydocuments.ucsf.edu/docs/jjxd0001

right?
A Correct. And that same process is what occurs in the lit cigarette.
Q You have a quantity of tobacco that you put in a vat or something; is that right?
A That's correct.
Q And then you put ammonia in there with it?
A Well, there are several ways of doing it. I described earlier today the sparging way of doing it and the experiment of Scott Osborne where you simply sweep ammonia threw it.
The other way is to put it in and try to flash it off. So if you do that, you require a much

0129

larger concentration of ammonia.
Q Do you know how much ammonia is used in the method you just referred to as flashing it off?
A It's described in the patents. We could look them up and find out. I don't recall exactly.
Q When you say "described in the patents," you are referring to the patents that are cited in the "Background of the Invention" section or something else?
A No. They say "Representatives of such process are disclosed in U.S. Patents," and they give you a series of numbers.
Q And those are the patents where the amount of ammonia would be described; is that right?
A That's correct.
Q As compared to the amount of ammonia in a cigarette, in those processes, is a large amount of ammonia used, sir?
A Yes.
Q Okay. Is the tobacco in the denicotinization process exposed to a flame?
A It's indirectly heated. Normally, we say direct heat is direct exposure to a flame, and indirectly heated is when it's inside of a cylinder and the cylinder is heated with a flame.

0130

Q Okay. Is there combustion and pyrolysis in the denicotinization process?
A A minor amount of pyrolysis.
Q When you say "minor," can you characterize that for me?
A Maybe one percent or half a percent. I'm just estimating there for the purposes of answering the question. We could actually determine that by looking at the degradation products and measuring that.
Q How much pyrolysis is there done of tobacco in a cigarette?
A Depends on the construction of the cigarette. There is a relationship between how much is combusted and how much is pyrolysis depending on puffs and construction and all those things.
Q Are you able to give a range of how much is pyrolysis?
A I would have to go back and look at some of the papers. Let's say approximately 25 percent -- 20 to 25 percent.
Q How much is combusted?
A The remainder.

http://legacy.library.ucsf.edu/tid/otn05a00/pdf
Digitized by the Legacy Industry Documents Library - http://industrydocuments.ucsf.edu/docs/jjxd0001

Q 70 percent, in that instance?
A Something like that.

Q How much combustion is there in the denicotinization process using ammonia?
A Well, there is no air, so there is very little combustion.
Q Is the denicotinization process using ammonia a closed system or an open system?
A I haven't looked at all of these. My guess is that most of them are closed or my estimation, but you can do it in an open system, as I indicated earlier.
Q And is a cigarette a closed system or open system?
A It's an open system.
Q Okay. What are the temperature ranges at which denicotinization with ammonia are performed?
A If I recall correctly, it's everything from slightly above ambient up to several hundred degrees Celsius.
Q Okay. What is the temperature at which a cigarette burns?
A It burns when it's idle sitting at like 200, 300 C, and then it goes up to 900 C or so during the actual act of puffing.
Q What is the percentage of oxygen present in a denicotinization process using ammonia?

A It can vary depending on the process.
Q Can you give a range, or is that not possible?
A It's possible. We talked about the sparging stuff I talked about before. In that case you are talking about, you know, 19, 20 percent. In the process for just commercial denicotinization, you might find zero or a half a percent. So the range is from zero to 20 percent, zero to 19 percent, something like that.
Q How much nitrogen is present in a denicotinization process using ammonia?
A Let's see. Approximately 85 percent.
Q Okay. How much nitrogen is present in the lit cigarette environment?
A Well, depends on which phase we are in. During the combustion phase when we are sucking in air, it's about 80 percent nitrogen.
Q Did you work with Cliff Lilly on this invention?
A No. Cassandra Owens worked in the physical research division, and Cliff worked directly for me. And much of this work was done while I was there.
Q Dr. Farone, are you familiar with a field

called industrial hygiene?
A Yes.
Q What is industrial hygiene?
A In the broadest terms, industrial hygiene deals with maintaining conditions for workers in industrial practice that does not expose them to any undue risk.
Q Are you an industrial hygienist?

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Courtesy of the Legacy Tobacco Documents Library (LTDL) at the University of California, San Francisco (UCSF) http://industrydocuments.ucsf.edu/docs/jjxd0001

A In a sense.
Q In what sense?
A Well, I have a company, as you know, Applied Power Concepts, Inc., of which I'm president. And it's a small company where you have 11 people, so the responsibility for the industrial hygiene for my company rests totally with me.
Q Other than your work with your company, are you an industrial hygienist?
A Not professionally, if that's what you mean.
Q Are you an expert in the field of industrial hygiene?
A Yes.
Q Is that, again, related to the work you do for your company?
A That's correct.

0134

Q Okay. Did you do any undergraduate or graduate school work on industrial hygiene?
A When I went to graduate school and undergraduate school, it was all treated much more generally. There were no specific courses called industrial hygiene.
Q So because there were no courses, you didn't take industrial hygiene courses?
A I mean, in chemistry class you are constantly made aware of all of the properties of what you were doing and dealing with that related to the risk involved in using those materials or in being exposed to those materials, which is essentially industrial hygiene. It just wasn't called that.
Q Okay. Apart from the work you do for your company, would you call yourself an industrial hygienist?
A No, I would not.
Q Have you ever taught any courses in industrial hygiene?
A Only as part of chemistry courses that I have taught or as part of being at Lever Brothers where I worked on committees whose job it was to instruct technicians and chemists in proper

0135

utilization and handling of chemicals and materials.
Q The portion of your answer where you referred to as only as part of chemistry courses you taught, what are you referring to there?
A I taught college for two years, Virginia State University.
Q In the sixties?
A In the sixties. And then when I worked for Lever Brothers, we had opportunity to educate the young chemists and technicians about proper industrial hygiene.
And at Philip Morris the directors interacted with Joe Cacciotti who was the industrial hygienist and gave direction on what to do and not do.
Q I want to focus on your chemistry classes that you taught to college students in the sixties.
A Okay.
Q When you say your chemistry classes dealt

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Courtesy of the Legacy Tobacco Documents Library http://industrydocuments.ucsf.edu/docs/jjxd0001

with industrial hygiene, what did you mean by that?
A There are chemicals that you handle that are either carcinogenic, teratogenic, or mutagenic, and those others that are plain explosive dangerous.
In order to teach students properly, you have to teach them to have proper respect for these

0136

chemicals, number 1, and then you have to teach them to handle them. That continues into the laboratory today.
We have a full laboratory in my company, and we make sure that we have all the material safety data sheets. We make sure we have emergency plans for proper monitoring. For example, if you are dealing with carbon monoxide, we have the monitors, radioactive monitors, and all of the things that encompass industrial hygiene.
Q People who are in charge of labs, for instance, deal with industrial hygiene issues; is that correct?
A Yes.
Q That does not make them industrial hygienists; is that correct?
A That is correct. But if they made a mistake, they wouldn't be excused for making that mistake because they weren't an industrial hygienist.
Q What are the major publications in the discipline of industrial hygiene?
A Let's see. I believe there is a journal. I forget whether it's called "Journal of Industrial Hygiene." There is the American Institute of

0137

Government and Industrial Hygienists that publishes all kinds of materials that we have access to about industrial hygiene.
Q The journal, the name of which you couldn't quite recall, is that a journal you subscribe to?
A It's a journal that we read articles out of. We don't typically subscribe to journals. It's become too expensive. What you do is search a computer database and find the articles that are pertinent to what you are interested in, and you purchase only those articles by the article, so to speak. So you have access to all the journals without the costs of subscribing to them all.
Q Have you heard of a source called "Petty's Industrial Hygiene"?
A I've heard of it. We don't have a copy.
Q Do you have sufficient knowledge to know whether that is an authoritative source in the area of industrial hygiene?
MR. BROWN: I'm going to object as insufficient information available to render that opinion.
THE WITNESS: One must be very careful about authoritative sources of industrial hygiene. So I'm not prepared to accept any article as being

0138

authoritative because it carries with it an obligation on the part of my saying that to make sure I understand all the stuff that is involved about any specific chemical.

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Digitized by the Legacy Industry Documents Library http://industrydocuments.ucsf.edu/docs/jjxd0001

BY MR. LOMBARDI:
Q Have you ever looked at "Petty's Industrial Hygiene"?
A Not that I can recall.
Q What are TLVs?
A Threshold limiting values.
Q How long has that term been in existence, as best you know?
A As best I know -- well, I can only tell you the late fifties, something in that order. The late fifties is when I first became aware of it. Let's put it that way.
Q Do you know who came up with that terminology?
A Who invented the terminology? No, I don't.
Q What do you understand TLVs, threshold limiting values, to refer to?
A In the field of industrial hygiene, normally, it means a concentration of a chemical that you know to be distinguished from normal

0139

ambient conditions that one can be exposed to without undue risk. The exposure can be in the vapor phase for inhalation. It can be a skin exposure.
Q Is there some organization or entity that sets TLVs?
A Well, actually, there is a wide variety of organizations that do that. The ones that tend to be more important are those set by the National Institute of Occupational Safety and Health, which are frequently adopted by OSHA.
Q Is that organization part of the National Institute of Health?
A Yes, but NIOSH and OSHA are two different entities, so to speak. NIOSH makes recommendations. OSHA sets standards. And I mentioned the American Institute of Government and Industrial Hygienists. They also have standards for setting TLVs.
And there is the World Health Organization, the international standards. Sometimes in California there are state standards. So you have all of these different TLVs, if you will.
Q Okay. Now, do TLVs relate to the opinions you intend to present in the trial of this case?
A To the extent that I'm asked questions

0140

about exposure. TLVs are used by all laboratories, all chemists, and all people in exposure to give a measure of whether or not the exposure constitutes an unreasonable risk or not.
Q Do you use TLVs in some way in your analysis of cigarettes?
A I do.
Q How do you use it?
A We have to first recognize that a TLV is a sort of worst case scenario. You should never be exposed to a number larger than that. For normal air quality like in this room or in a house, normally it should be 100 to 1,000 times less than that.
While I was at Philip Morris, it became

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Digitized by the Legacy Industry Documents Library - http://industrydocuments.ucsf.edu/docs/jjxd0001

clear to the scientists there that many of the constituents in cigarette smoke, either as exposed to the smoker which is higher or in the ambient air for environmental tobacco smoke, greatly exceeded the TLVs for exposure to different chemicals.

And that is part of how I use it in my testimony, to point out the industry is totally aware of the fact that they are exposing people to levels that exceed the TLVs.

Q Okay.

0141

A And safe air quality standards are like 100 or 1,000 times less than the TLV.

Q Did you prepare any memos while at Philip Morris on the topic of TLVs and cigarette smoke?

A I believe I did.

Q Who were those memos addressed to?

A In that case, I believe they were addressed backed to Dr. Osdene, but it may have been Dr. Hausermann or Seligman. In the process of preparing those memos, there is a memo from Laszlo, in 1964, I believe, that I used as the starting point for that. There had been an earlier analysis of TLVs and tobacco smoke.

Q And you understand Dr. Laszlo to have done an analysis of TLVs and cigarette smoke back in 1964?

A I believe that's the time. It was already done long before I came there. And the sort of exercise, if you will, was to determine by what amount we exceeded TLVs with the idea we would then try and reduce those chemicals to a level consistent with the TLVs.

Q And how many memos did you write concerning TLVs during your time at Philip Morris?

A I can only recall one.

0142

Q What was the subject of that memo?

A I believe it had to do with some of the common gases that were easily preventable.

Q Do you have any specific recollection of what you wrote about in relationship to TLVs in this memo?

A The only recollection I have was that it was directed toward providing a target for our research work to be below that number. That is the recollection I have. And I don't recall, as I sit here, which particular chemicals of the many we happened to be interested in at that time.

Q Did you receive any response to this memo?

A Not that I recall directly other than Dr. Laszlo, who was still there, I believe, at that time, and he came and said something to the effect, "Well, you are thinking like I thought back in 1964."

Q Is that the only response you recall to the memo?

A No. I think I had a discussion with Dr. Osdene concerning the memo and maybe some of the people working for him.

Q When was the discussion with Dr. Osdene?

A I don't recall.

0143

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Generated by unknown on 2013-11-15 industrydocuments.ucsf.edu/docs/jjxd0001

Q Do you recall the substance of the discussion with Dr. Osdene?
A It had to do with whether or not those levels could effectively be achieved.
Q Can you remember in more detail what happened in that conversation beyond what you just said?
A Yes, I know in that conversation that one of the chemicals under discussion was carbon monoxide, and it was about the time we were doing the work on carbon dioxide filtration. The discussion was whether or not through the best technology we knew of, which was the carbon monoxide filter, we could reduce the carbon monoxide to a level consistent with the TLV.
Q What was said on that subject?
A It appeared possible. I don't recall the numbers or the values, but in the work that was done by Dr. Dwyer and Kassman, there was some numbers obtained on the amount of carbon monoxide and the numbers you could get down to.
Q Okay.
A And it appeared to be consistent with TLVs.
Q Okay. So it wasn't definitive at that

0144

point, but it was possible you could get carbon monoxide down to the level of TLVs?
A As I recall it.
Q Did this carbon monoxide work relate to the cobalt filter?
A Yes, the cobalt on alumina.
Q Any other conversations about TLVs other than what you told me?
A There was a case about oxides of nitrogen getting below the TLV.
Q And you had a discussion with somebody about that?
A Yes.
Q With whom?
A Gee, that was a lot of people. Dr. Osdene, Dr. Seligman, Dr. Hausermann, Dr. Gaisch.
Q And does that have to do with the NOD program, or is that something different?
A NOD was the genesis of the discussion because, as you know, Philip Morris had technology that removed, say, 90 percent of the nitrate in sheet materials. The problem was the remaining 10 percent was still enough to cause the problem. So we wanted to get out, as I testified before, 99.9

0145

percent of what was left.
Q But it was in that context that this discussion of oxides of nitrates in TLVs took place?
A Yes.
Q Was that NOD program terminated during your time at Philip Morris?
A We've gone through this ad nauseam. No.
Q Do you know who was responsible for making the determination -- let me state it this way: I don't want you to have to repeat everything. As I understand your testimony -- and correct me if I am

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Courtesy of the Legacy Tobacco Documents Library http://industrydocuments.ucsf.edu/docs/jjxd0001

wrong -- you at one point learned from Dr. Hausermann that the NOD program would not go forward because of cost concerns there.
Do I have that right?
A I'm not sure that happened with Dr. Hauserman or Dr. Seligman, but yes, it happened more than once.
Q Okay.
A It happened with Seligman as a result of the 1980 Susan Dobberstein memo that we had at trial.
Q Right.
A And subsequently later toward '84 with Hausermann. So twice that happened.

Q It was either Hausermann or Seligman that you had those discussions with?
A Right. Excuse me. And/or.
Q Understood. To your knowledge, were Hausermann or Seligman responsible for making the decisions about whether to implement NOD or not?
A That's a very interesting question.
Q Just to your knowledge is what I am asking.
A They weren't unilaterally responsible, if that is what you mean. They had responsibility. They provide advice. But they couldn't make it happen by saying yes or no either way.
Q So someone else was responsible for making it happen?
A Correct.
Q Do you know who that was?
A Normally, the chain of events would be that if you were going to make a change like that like we do for the laser perforation, the presentation would be made to New York management, and New York management would be the final decision.
Some of them could be approved at the Philip Morris USA level. Some of them had to go to Philip Morris, Inc., depending on the cost. I think

the cutoff was a million dollars. If it was more than a million dollars it had to go to Philip Morris, Inc. If it was less, the president of Philip Morris USA and local management could do it.
Q Is it correct you had a general understanding of who made decisions on technology rising to certain cost levels, that you had a general idea of how that was done; is that right?
A More than general. The projects I was involved in was actually involving helping to prepare the documentation of what went forth for the decision. For example, the laser perforation, that was, as I recall, a $16,000,000 project. So I know that had to go all the way to Philip Morris, Inc.
Q Do you know who specifically was making the decisions on the NOD programs?
A No, I don't.
Q Okay. Have you ever seen any scientific articles published using TLVs as a standard for the amount of a particular chemical in smoke?
A Yes.

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Courtesy of the Legacy Tobacco Documents Library at industrydocuments.ucsf.edu/docs/jjxd0001

Q What scientific publications are you referring to?
A These are papers published by the

0148

Environmental Protection Agency where they are the jumping off point for some of the determinations that EPA makes in terms of what is safe ambient air quality.
Q Okay. And is that related to what is called ETS, environmental tobacco smoke?
A It's related to tobacco smoke. It's related to chemicals in general. For example, the first indication usually of a problem with a chemical is due to worker exposure, and it's based on worker exposure.
Usually EPA will regulate general air quality exposure throughout the country. So they use that number, cut it by 100 or 1,000, and say this is the level we should have based on a projection of risk where the risk is determined by people who have been exposed to the TLV or numbers around the TLV.
Q Is it your testimony the EPA issues publications saying that the smoke intake of a cigarette smoker should be subjected to the thresholds set forth in TLVs?
A I'm not quite sure I understand your question.
Q Let me try again. This EPA publication,

0149

does it purport to deal with the amount of smoke a cigarette smoker -- let me strike and try again.
The EPA publication, does it deal with the amount of certain chemicals that a smoker should take in while smoking a cigarette?
A Not specifically. It deals with the amount of chemicals that anyone should take in. Whether he is a smoker or nonsmoker doesn't matter.
Q So the EPA publication doesn't deal specifically with the amount of a chemical constituent in smoke that a smoker should take in; is that right?
A Not should take in. It deals specifically with the amount of chemical that no one, whether smoker or not, should take in.
Q Does it deal with the amount of a chemical you should take in through the act of smoking?
A In my opinion it does.
Q In your opinion, the EPA is setting forth threshold limiting values that are applicable to the amount of smoke a smoker takes in?
A Yes.
Q Okay. And does EPA expressly say that?
A No.
Q Has anybody other than yourself said that

0150

in the scientific literature?
A Oh, yes.
Q Who?
A You can read the information of Jim Rapace, R-a-p-a-c-e.
Q Who is that?
A There are some articles. There is one

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Digitized by the Legacy Industry Documents Library - http://industrydocuments.ucsf.edu/docs/jjxd0001

article in the literature I brought you.
Q Who is he, though?
A He is a former EPA person who has since retired but, you know, published papers about the relationship between the amount of chemicals that one should take in, whether they are a smoker or not a smoker. Here is chemicals in smoke and here is acceptable levels, and here are levels that aren't acceptable.
Q Is he purporting, as you understand it, to make a determination of the chemicals in smoke and their levels that one should receive while in the act of smoking?
A You mean smoking actively?
Q While you are smoking a cigarette.
A He is more concerned about passive smoking. Now, you need to understand this because I think this is where we get into a lot of confusion,

0151

that whether you are a smoker or not doesn't enter into it.
In other words, the smoker is subjected to more passive smoke than a nonsmoker. They sit in the environment of the smoke all the time. Whatever you say about passive smoke applies, in my opinion, to a smoker. They are the ones most at risk from passive smoke.
Q I'm asking about somebody smoking a cigarette and the smoke they receive from the act of smoking the cigarette.
A Okay.
Q Does Rapace purport to set levels for what somebody should take in as part of the act of smoking?
MR. BROWN: Sounds like you are saying one cigarette.
MS. CHABER: No, no, no.
THE WITNESS: I think I can help if you let me. Basically, he doesn't set limits on mainstream chemicals being inhaled by a smoker, I don't believe. That is not the issue.
The issue is the amount of that chemical that is acceptable to anybody, whether it's from inhaling sidestream smoke or mainstream smoke.

0152

BY MR. LOMBARDI:
Q So let me go farther with you. Other than Mr. Rapace or Dr. Rapace, whatever the case may be, are you aware of any other scientific articles written that apply TLVs in the context of a smoker who is actively smoking a cigarette?
A Yes, there is lots.
Q Name one.
A I brought one from the Center for Disease Control that is in the stack there of some of the minor ingredients.
Q Let's just say that you were looking through the file of documents that you brought today, and you pulled one out of that pile, Dr. Farone?
A Yes, I have.
Q What have you pulled out of that pile?
A That was a pile of -- it's a paper written

http://legacy.library.ucsf.edu/tid/otl05a00/pdf
Digitized by the Legacy Industry Documents Library - http://industrydocuments.ucsf.edu/docs/jjxd0001

by Steven Stanfill, S-t-a-n-f-i-l-l, and David Ashley, Department of Health and Human Services and Center for Disease Control and Prevention.

Q Okay.

A And it goes on to say that some constituents found in natural flavorings are known to exhibit toxic properties, and it goes on in the

0153

article to talk about things that have been shown to cause pulmonary edema and been estimated to be 250 times more toxic when inhaled than ingested. So they are comparing these materials with normal concentrations that people are exposed to.

Q In that article, did they apply TLVs to the constituents of smoke that a smoker gets when actively smoking a cigarette?

A No, not specifically.

Q Is there any mention of TLVs in that article?

A They just deal with micrograms of stuff they detected.

Q Is there any mention of TLVs in the article?

A No.

Q Are there any articles that you are aware of that apply TLVs to the amounts of constituents of smoke received by somebody actively smoking a cigarette?

A Yes.

Q What?

A The laws regarding OSHA.

Q OSHA's laws?

A Uh-huh.

0154

Q Is that relating to ambient smoke?

A I concluded in my company, for example, that it would not be legally acceptable under OSHA for me to allow anybody to smoke.

Okay. When I first moved down here and I moved into Irvine, they had a regulation with regard to allowing people to smoke. You had to segregate smoking and nonsmoking areas. So I wrote to ACGIH, and the point was whether the law forces you to have an area to allow people to smoke.

And when I discussed it with the regulators in Irvine and pointed out that the concentrations you were allowing the smoker to get were above the TLVs, they ruled that I did not have to have a place to have people smoke.

Q So it's your testimony that OSHA, which is a federal agency --

A Correct.

Q -- regulates the amount of particular constituents that smokers can receive in the act of smoking?

A No, that's not my testimony. Be very careful.

Q Before you go on, let me just ask, does OSHA regulate the threshold levels of smoke

0155

constituents that a smoker can receive in the act of smoking?

A In my opinion, they do.

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Generated by tobaccoindustrydocuments.ucsf.edu/docs/jjxd0001

Q Does OSHA believe it does?
A I don't know what they believe.
Q Do you know anybody else who interpreted OSHA's regulations in the way you have other than, I guess, people from Irvine you spoke to?
A I think most of the state of California now has interpreted it that way.
Q So in the state of California, is it illegal to smoke?
A It's not illegal to smoke. It's illegal to smoke in places where by the act of smoking someone who works in that place would be exposed, including the smoker, to the chemicals that are in smoke.
Q You are talking about regulations relating to ETS, whomever is affected by ETS?
A Right.
Q What the state of California and OSHA do not purport to regulate is the smoke constituents that a smoker receives while receiving smoke through the filter of a cigarette into their mouth; is that right?

0156

A It's an impossible thing we are talking about. If they can't receive the sidestream smoke, then they can't light it up, so yes, it does cover the smoker in the act of smoking.
Q Does it purport to regulate the smoke that a smoker receives in the mouth, what is known as mainstream smoke? Let's strike the question.
Does OSHA purport to regulate the mainstream smoke that a smoker receives?
A Now we changed back to OSHA?
Q Sure.
A We would have to get the regulations. My understanding of those regulations is that it applies to a smoker in my place of business, that I have a liability to prevent that smoker from being exposed to those chemicals whether he drinks them out of a cup, is exposed to them through somebody else's smoking, or to his own smoking. So that is my understanding. Yes, it does.
Q Okay. That's your understanding?
A That is correct.
Q Okay. Has OSHA attempted to regulate the amount of chemical constituents of smoke that a smoker can receive in the mainstream smoke?
A I think I just testified that in my

0157

opinion they do.
Q Okay. Have they said that?
A The law says that. Let's see if I understand. Did someone from OSHA call me up and say, you know, "You can't let your people smoke"? No, no one ever did that. If they did and said it was okay to let them smoke, I would still be liable if I let them smoke.
Q Okay.
A I cannot be absolved of my obligation to meet the law because the enforcing agency decides not to do it for whatever reason. You have to read the law, and you have to make a determination.
As the chief executive officer of my

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Digitized by the Legacy Industry Documents Library - http://industrydocuments.ucsf.edu/docs/jjxd0001

company, I have the liability to understand that law, not what I am told by somebody from OSHA, and I have the obligation to interpret it.

If we get the laws here and we read it, I think we can conclude very simply, like I did and other companies around here have, that you can't expose people to dangerous levels of chemicals by any means.

Q Sir, and that is something, as far as you know, is just generally accepted?

A Yes.

0158

Q Okay. Sir, has the surgeon general used TLVs in any way?

A Not that I am aware of.

Q Has IRC used TLVs in any way?

A I'm not sure.

Q Has the AMA used TLVs?

A As we just got through discussing, it's all in the context of environmental.

Q Has the AMA used TLVs?

A I believe they have.

Q Has the American Cancer Society used TLVs?

A No, they haven't.

Q Any organization other than OSHA and the state of California?

A World Health Organization. Almost anyplace that has regulations involving ambient air quality for smokers and nonsmokers uses TLVs.

Q Just to make sure I understand, sir, does OSHA make it illegal for somebody to smoke a cigarette?

A No.

MS. CHABER: Where?

BY MR. LOMBARDI:

Q Your testimony is that OSHA requires you

0159

as an employer to prevent somebody from smoking a cigarette at your workplace; is that correct?

A My testimony is that OSHA requires me to prevent exposure of my workers to carcinogens, teratogens, and mutagens regardless of their source, whether it's in a cup I have sitting on the desk or through the act of smoking a cigarette.

There is no distinction in OSHA as to when it's okay to kill somebody and when it isn't. You just can't do it.

Q So does it prevent you from hiring somebody who smokes in their own home?

A No.

Q Does OSHA prevent you from employing somebody who smokes someplace outside the workplace?

A No, it doesn't.

Q Dr. Farone, as I understand it, you make a comparison between TLVs and amounts of particular chemical constituents received through the act of smoking; is that correct?

A That is correct.

Q Pick a chemical if it helps you to describe. Can you explain how you do that?

A Certainly.

Q Please do.

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Digitized by the Legacy Industry Documents Library - http://industrydocuments.ucsf.edu/docs/jjxd0001

0160

A The concentration most normally used in determining the concentration of a chemical that you can be exposed to --

Q For OSHA purposes you are talking about?

A For any purposes that involve exposure to chemicals in concentration units, simply, milligrams of the material per cubic meter that you are breathing, if you wish.

And in the act of smoking a cigarette, we have to be careful how we do it, but we can define the volume of puff total that has been taken during the act of smoking.

Given the discrepancy between the machine and human smoking, we can talk about how you change the values. But generally speaking, if we agreed on a protocol, we can agree that a cigarette delivers so much of a given chemical to the smoker in the mainstream, either in the particulate face or the vapor face or the sum of the two.

We look at those numbers. If we use FTC tests, 300 puffs or 350, some number like that, the total puffs for a cigarette, and we divide that into a cubic meter, that gives us the factor by which the delivery for one cigarette is scaled to that concentration, which is universally used of

0161

milligrams per cubic meter.

Then you can simply compare that with published exposure concentrations regardless of their source, whether it could be off the pavement or from a terrorist bomb or from smoking, that you should not be exposed to.

That is the calculation that I do to determine relative risk from the chemicals that are in the smoke. In other words, those chemicals which exceed that number by a lot are more risky than those which don't exceed it. That is the same calculation done at Philip Morris and the same calculation that Dr. Laszlo did in 1964.

Q Sir, are you aware of any limitations placed on the use of TLVs by the organizations that set the TLVs?

MR. BROWN: Objection as overbroad, ambiguous, vague.

BY MR. LOMBARDI:

Q You are an expert on TLVs?

MR. BROWN: He is not an expert on the five or 6,000 possible questions you just asked.

BY MR. LOMBARDI:

Q If you can answer, go ahead. If you can't, tell me.

0162

A There are limitations.

Q What are the limitations?

A It doesn't apply, for example, to the inside of your automobile when you are driving. We talked about these limitations. They are put there as guidelines for exposure to those chemicals in the environment.

And EPA now developed a different set that has to do with ambient air concentrations that are acceptable. You see first stage alert and second

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Generated by unknown on 2014-03-24 industrydocuments.ucsf.edu/docs/jjxd0001

stage alert on smog. They have concentrations.
So there are different limitations for ambient air quality than there are for worker exposure. The worker exposure is much higher. They deal with the workplace. For the real conversation about what we are talking about, you need to look at ambient air quality numbers.
Q I may not have made my question clear, Dr. Farone. What I am concerned with is do the organizations that issue TLVs put limitations on what context those TLVs can be applied to?
A I thought I was answering that. For example, OSHA is only applicable to the workplace. It doesn't apply to your car, your house.
Q Any other limitations you understand that

0163

OSHA places?
A By OSHA, you mean the agency as opposed to the law itself?
Q Yes.
A No.
Q Are you aware of any other limitations that any other organizations setting TLVs place on the context in which TLVs should be used?
A Context? They all have limitations under the law of applicability to where they must be used. Is that what you are referring to?
Q Where they can be used is what I am referring to specifically.
A I don't know of any law or regulation that prevents you from using them for any legitimate scientific purpose.
Q To be clear, I'm not talking about a law or a regulation. I'm talking about a statement by organizations setting forth TLVs indicating that there are limits on the contexts in which those TLVs should be used.
A I have seen such statements. I think I just described that.
Q Any beyond what you already described to me?

0164

A I don't recall exactly the context, but, for example, a wine taster, okay, can be exposed to a level of ethanol that is beyond the level allowed in the TLV. There has been some rulings of things like that.
There are some limitations where it has been used. It doesn't mean you couldn't apply it, but they have made statements you shouldn't apply it in certain situations.
Q Are you aware of any other limitations beyond what you testified to today?
A I'm aware of them. I can't recite them. In other words, I'm aware they exist. I don't have a list with me.
Q Do you know of any beyond what you recited today?
A Do I know of any? I don't know if this may be helpful. I don't know. I once wrote a letter asking whether or not they applied to the smoking situation we just discussed. I wrote it to ACGIH and wrote it to OSHA, and I never received a

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Digitized by the Legacy Industry Documents Library - http://industrydocuments.ucsf.edu/docs/jjxd0001

response. So I'm not sure about that.
Q They didn't respond to your inquiry whether it applied to the smoking situation?
A Correct.

Q Are you familiar with a 1991 EPA study that specifically is part of the study dealing with BAP, benzo(a)pyrene?
A Probably I have seen it. I don't recall it as I sit here.
Q What does the term "body burden" mean to you?
A Body burden is usually expressed in things like micrograms or milligrams per kilogram in terms of how much of a chemical that you have been exposed to or can accumulate or can react with or something along those lines.
Q Okay. What has the EPA said about the percentage of a one to two pack a day smoker's body burden of BAP that comes from smoking?
A When are you referring to?
Q '91.
A Well, why should we stop at '91?
Q I would like to know if you are aware of what they said in '91.
A No, I'm not because it's been superseded.
Q You don't know what they said in '91; is that correct?
A That's correct.
Q Have they said something later about the

body burden of a one to two pack a day smoker's body burden of BAP that comes from tobacco?
A Yes. In my discussions with people working at EPA, it's my understanding that -- again, reading the articles of Mr. Rapace is the best way to do it -- but that there is a significant burden there.
Q What is the burden? Can you quantify it in percentages?
A No.
Q This is based on oral discussions you had with the EPA?
A No. I think it's based on public information. I don't have all of the data with me. It's based on public information.
Q Do you have any data?
A I have Mr. Rapace's articles.
Q Okay. And that talks about, just so we are clear, the body burden of BAP that comes from tobacco versus nontobacco sources for a one to two pack a day smoker?
A I don't know. I'd have to look and see whether it does or doesn't.
Q As you sit here today, are you aware of anything other than the 1991 EPA study that talks

about how much of a one to two pack a day smoker's body burden of BAP comes from tobacco as opposed to nontobacco sources?
A You are talking about the relative amount from the various places?
Q Can you answer the question?

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Courtesy of the Tobacco Industry Documents Library at the UCSF Library http://tobaccodocuments.ucsf.edu/docs/jjxd0001

A No. I'm not aware of the numbers.
Q Sir, you have suggested from time to time that you could have a cellulose cigarette; is that correct, a cigarette that is made of cellulose rather than tobacco? If I have it wrong, just tell me.
A No. I think what I have said is that what you burn on the basis of information that has been published like in patents and things of that sort, that the condensate, the smoke from the burning cellulose has a lower carcinogenic potential.
It doesn't mean it's safe. If we use all of those seven different tests that the companies have and we look at all of the parameters, it's safer. So I have suggested that it's better if you are going to expose people to expose them to lesser amounts of known carcinogens than to expose them to more.
Q How does that tie into cellulose?

0168

A Cellulose gives you lesser amounts. One of the benefits of reconstituted leaf or RL is the fact its higher in cellulose than normal tobacco. Therefore, if you are careful with it and don't put in extra stuff that you don't need, you end up with something that is less -- the smoke from burning that is less toxic, less carcinogenic.
Q Does the smoke from cellulose still contain carcinogens?
A Yes, it does.
Q Does it contain acetaldehyde?
A Yes, it does.
Q Does it contain acetaldehyde in amounts greater than would be found in a conventional cigarette?
A Not formulated correctly, no.
Q What do you mean by "not formulated correctly"?
A Well, I mean, if you are comparing just burning 100 percent cellulose, if you look at a cigarette that has a lot of sugar added to it because of the difference in coal temperature and how you formulate it and all of that, you can end up with more acetaldehyde from a conventional cigarette than you do from the material with cellulose in it.

0169

Q Let me have you take a cellulose cigarette without sugar added. What is the comparison between acetaldehyde production by that cigarette and a conventional cigarette?
A I don't have enough information. You have to tell me all the parameters for the cigarette.
Q Okay. Sir, is information about the chemical constituents of smoke from particular brands publicly available today with respect to the brand sold by at least some tobacco companies?
A Well, if you could break it down.
MS. CHABER: A little vague.
BY MR. LOMBARDI:
Q Is information about the constituents of smoke from particular brands available publicly today?
MS. CHABER: I think that has the same problem

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Digitized by the Legacy Industry Documents Library - http://industrydocuments.ucsf.edu/docs/jjxd0001

as the last question.
THE WITNESS: Let me explain the problem I'm having.
BY MR. LOMBARDI:
Q Fine.
A There is thousands of constituents.
Q Right.
A So that is the main problem.

Q I guess, is it true that scientists today don't know all the constituents of smoke?
A That's true.
Q Is there publicly available information about the known constituents of smoke from particular brands available today?
A Some of them. Some of the known constituents, for example, nicotine, nornicotine, maybe some on carbon monoxide, some of those values, yes.
Q Are you aware of lists of, say, over 1,000 constituents of smoke from particular brands that are publicly available today?
A I'm aware of some publications that have been made by the industry on some of the cigarettes that are being sold.
Q What publications are you referring to?
A I'm referring to the publications that came along with Accord, Premier, Eclipse, where much of the information with regard to the comparison of those products to conventional cigarettes has been disclosed and publicized.
Q Are you aware of any lists similar to those for Accord, Premier, and Eclipse that have been disclosed concerning other cigarette brands?

A In the United States, I'm aware of some that occurred. In Europe I'm aware of some.
Q Other than those, are you aware of any made by U.S. manufacturers?
A No, I'm not, not in the same scope. I've seen some stuff.
Q Are you aware of any disclosures of constituents of smoke along the same degree of detail as for the Eclipse, Premier, and Accord made by entities other than United States tobacco companies?
A From time to time you see some information in the literature. Yes, I'm aware of them. I don't remember them all.
Q Dr. Farone, I think part of your safer cigarette concept involves elevating the pH above what is found in conventional cigarettes.
Do I have that right?
A No. That's just one.
Q I said part of it?
A Yeah. But it's not part of it. It's sort of a separate thing that was suggested at Philip Morris to be a way of keeping people from inhaling.
Q Is that something you recommend today, raising the pH?

A You raise it to the point of becoming noninhalable, not just a little bit.

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Digitized by the Legacy Industry Documents Library - http://industrydocuments.ucsf.edu/docs/jjxd0001

Q To what level do you recommend it be raised?
A Eight, eight and a half.
Q When you say eight or eight and a half, to that level, it's not inhalable and the smoker would choke or gag if they tried to inhale it?
A You get a quicker dose of nicotine, so you get a gagging reflex, yes.
Q And pH of eight or 8.5 of smoke, is that similar to the level you get for cigar or pipe smoke?
A Similar to cigar. Pipe is a little less, if I recall correctly.
Q What is the difference between a cigarette at 8.5 pH and a cigar?
A A cigarette is smaller and has less tobacco. It's easier to carry, easier to burn.
Q What is the difference in the smoking experience for the smoker?
A The smoking experience for the smoker? Well, if we base the proposition on that one smokes for nicotine, then they both would be deriving their nicotine the same way. That is through the oral

0173

cavity and through mucosal tissue as opposed to getting it from the lung.
Q A smoker of your 8.5 pH cigarette would not inhale; is that correct?
A Would be much less likely. There is probably still going to be -- there are people that can inhale cigars, but generally speaking --
Q People who smoke cigars generally don't inhale; is that correct?
A That's correct.
Q Have you done any studies to determine whether consumers would accept a cigarette with a smoking pH of 8.5 or thereabouts?
A It was a study of Philip Morris.
Q Did Philip Morris ever actually do consumer studies?
A I don't believe so.
Q Are you aware of anybody who has done consumer studies on that topic?
A Reynolds may have. I think I have seen some information about looking at the effects of smoke pH and consumer acceptability in some of the literature I have seen in conjunction with litigation.
Q As you sit here today, can you point to

0174

any specific Reynolds' document?
A Other than I think there was a study that did pH of different cigarettes.
Q Anything that got to the range of a cigarette with an 8.5 pH?
A I don't recall.
Q Okay. Is it important to your opinion about using a cigarette with a smoke of 8.5 pH whether consumers would accept the cigarette?
A Yes.
Q Okay. And why is that important?
A Well, I mean, if it's going to cause a certain percentage of the people to switch to use

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Digitized by Arcadia http://industrydocuments.ucsf.edu/docs/jjxd0001

that product so that they become less exposed to chemicals that are acting on lung tissue.

I mean, it doesn't solve all your problems, but the idea is you want to reduce lung cancer and emphysema. It has to be acceptable at least to the point where they would use it because if they won't use it, then it doesn't do much good.

Q Okay. Is it your contemplation that a cigarette with smoke pH of 8.5 or in that range would be offered in addition to cigarettes with conventional pH ranges?

A It could be. I mean, that is one

0175

possibility. And, you know, recently there has been a great revival in cigar smoking, even here in California. And so there is a certain percentage of the population that will obtain their nicotine without inhalation. That is for sure. There are pipe smokers, cigar smokers, and snuff users.

When I went to Philip Morris, I was a pipe smoker, and I went to Philip Morris with the expectation of getting free Bond Street. It said on the can, "Philip Morris." I got there and found out that basically they sold all that business off.

They didn't want to be in any business where inhalation was not part of it because they simply didn't believe you could keep customers if they weren't inhaling. That was, I believe, not a tested hypothesis. It's my hypothesis that you can. That is evidenced by the fact that there are cigar smokers, and it's gaining in popularity.

So I think a cigarette that is noninhalable might just be useful. It doesn't solve all your problems, but there is certainly nothing wrong with giving it a shot.

Q You are not suggesting that the high pH cigarette would be the only type of cigarette offered for sale as part of your recommendation for

0176

how to come up with a safer cigarette?

A No.

MR. LOMBARDI: Let's go off the record.

(Recess)

BY MR. LOMBARDI:

Q Dr. Farone, you testified before the break that Philip Morris was at one time in the business of selling pipe tobacco; is that right?

A That's correct.

Q When did Philip Morris go out of the business of selling pipe tobacco?

A They were out of the business when I arrived there in '76. And from discussions I had with people when I first got there, I'm under the impression it was the early seventies, maybe two years before that time or something like that.

Q Maybe two years before you arrived?

A '74, I would estimate.

Q Do you know who made the decision that Philip Morris would get out of the pipe tobacco business?

A Well, it's interesting you should ask that. I was told by three different people that they made the decision, so I don't know who to

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Digitized by the Legacy Industry Documents Library - http://industrydocuments.ucsf.edu/docs/jjxd0001

believe.

0177

Q Okay. And who are the three people that told you they made the decision?

A Ross Millhauser mentioned it at one meeting. Hugh Cullman mentioned it another occasion. And once when I had lunch with Cliff Goldsmith, he said he made the decision.

Q And each of those individuals are former executives of Philip Morris?

A Correct.

Q And you, from your own personal knowledge, don't know which of them made the decision because you weren't there at the time?

A That's correct.

Q Did Mr. Millhauser, when he told you that he was responsible for terminating the pipe tobacco business, did he tell you why he had terminated it?

A Yes.

Q What did he say?

A You want my interpretation of what he said, or do you want exactly what he said?

Q I want exactly what he said.

A If I can recall it, it's very similar to what he said when they sold American Safety Razor. Unfortunately, the product didn't contain the ingredient that kept people using it over and over

0178

again.

Q Is that a quote?

A Something to that effect.

Q And this was an oral conversation he had with you?

A One of them. They weren't really oral conversations. They were comments made at the Richmond meeting.

Q These are meetings where executives would go down to Richmond and meet with some of the employees there?

A Correct, to monitor the progress or what was going on in the research and development center.

Q Was anybody else present for those meetings?

A Lots of people.

Q Okay. I guess I should be more specific. When he made the particular comments about why he sold the pipe tobacco or terminated the pipe tobacco business.

A There are two different instances. One was when they sold American Safety Razor. I think it was like the first or second meeting I went to, which would have been probably in late '76 or sometime, where I asked the question. That wasn't

0179

part of the official meeting.

I think Hugh Cullman was there. Bob Seligman was there. Mr. Mc Dowell was there. There were a bunch of executives sitting around him when they had this discussion.

Q Who else was present other than the people you mentioned?

A Typically, there are 20 people in the room.

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Courtesy of the Legacy Tobacco Documents Library http://industrydocuments.ucsf.edu/docs/jjxd0001

Q You understand I'm talking about just the part of the conversation -- I'm referring to the part of the conversation that dealt with the termination of the pipe tobacco business.
A Yes.
Q Okay.
A I think that was a local conversation. Sitting next to him, if I recall correctly, was Mr. Hugh Cullman who was on his right and my left. I faced him. At the corner of the table was Mr. Mc Dowel. And Dr. Seligman, my boss, was next to Mr. Mc Dowel.
Q And this conversation took place in '76; is that correct?
A Yes.
Q When did the conversation with Mr. Cullman

0180

occur in which he told you he was responsible for getting Philip Morris out of the pipe tobacco business?
A A significant time later over lunch.
Q Was there anybody else present for that conversation?
A Yes. We very rarely ate lunch one on one. There would be four people at the table. That is the usual thing. So two other people I don't recall.
Q Did Mr. Cullman tell you why he had terminated the pipe tobacco business?
A No.
Q Okay. And I think you mentioned Mr. Goldsmith also took credit for closing down the pipe tobacco business.
A Correct.
Q When did you have that conversation with Mr. Goldsmith?
A That is at a time when I believe he was either chairman or co-chairman. It was quite a bit later on before he was replaced by Mr. Maxwell. Maybe '81 or something like that.
Q And where did that conversation take place?

0181

A Again, in the lunchroom.
Q In Richmond?
A In Richmond.
Q And the Coleman conversation was in the Richmond lunchroom?
A Yes.
Q Was anybody else present for your conversation?
A Again, there is two other people always present, four per table.
Q You cannot remember who they are at this point?
A No, I can't.
Q Did Mr. Goldsmith tell you why he had terminated the pipe tobacco business?
A Decreasing sales.
Q Anything beyond that?
A Not that I can recall.
Q Dr. Farone, there was biological testing done at Philip Morris during your time there; is

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Courtesy of http://industrydocuments.ucsf.edu/docs/jjxd0001

that correct?
A Yes.
Q Okay. What type of biological testing was done during your time at Philip Morris? And I'm talking about at Philip Morris itself.

0182

A At Philip Morris in Richmond?
Q Or any other Philip Morris facility in the United States.
A In the United States. Okay. Basically, there were two types. One was the so-called in vitro test for various toxic properties of tobacco smoke constituents. Those would be things like the Ames test and similar kinds of cell level tests.
Q There are two total, is that correct, two total biological tests?
A No, no, no. Two total kinds of biological tests.
Q Why don't you give me the second kind.
A The rat studies of Victor De Nobele on the pharmacology of nicotine, that is the second kind of biological test.
Q The rat study is known as what?
A It's an in vivo test.
Q The test on toxic properties, I think you mentioned the Ames test. Were there other types?
A There were several of them. I don't know if I can enumerate them all. There is at least four or five. I think there is five. There are a couple hamster cell tests and HeLa cells, which are human

0183

cells.
The reason why it's difficult is there were always some under development and some used routinely and some that had been used but had been replaced by tests that the people in Dr. Osdene's area considered to be better than the ones they were using before.
Q If you can, can you generalize as to the way these in vitro tests were performed?
A Yes.
Q Okay.
A Basically, you are monitoring changes in cells, whether they be bacteria cells or yeast cells or hamster cells or human cells, and you are applying some fraction of smoke. Usually, it's a condensate as opposed to something you collect off a Cambridge pad, or it could be off the pad.
You collect the whole smoke condensate, usually in many cases the smoke to be fractionated, and then various fractions applied in the test to determine which of the fractions had the highest activity.
Most of the work was directed toward determining which fraction of smoke or what things in smoke had the highest activity in the various

0184

tests.
Q Okay. And these, I take it, were done in Petri dishes or something along those lines?
A Test tubes, Petri dishes, small flasks like that, yes.

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Creative Commons https://industrydocuments.ucsf.edu/docs/jjxd0001

Q When you said fractionated smoke, what did you mean by fractionated?
A We talked before about the difference between the Cambridge pad and the whole smoke where you collect everything in a coal trap. If you take that, you could, for example, extract it with alcohol and evaporate off the alcohol, and then you have the alcohol soluble fraction.
You could extract it with water. You could extract it with methylene chloride, which is used for like removing paint. You have different solvents to extract with.
Those fractions, depending on how you did it and what you added at the time you extracted it would contain different classes of chemical compounds.
If you could isolate it down to a particular fraction, which they were able to do, then you can identify within that fraction more easily what specific chemicals are responsible for

0185

the result. That would give you clues as to which ones you would like to either reduce or eliminate.
Q So it's a way to help you determine which chemical constituents of smoke you would like to remove, for example, from the smoke product?
A These are standard toxicology or toxicity tests, and the toxicity can be of many different forms. What you are trying to do is determine which constituents are the most toxic in the different tests.
Q Okay. Now, this work, as I understand it, was not under your directorate; is that correct?
A That's correct.
Q Your directorate was applied research?
A That's right.
Q This work took place in which directorate?
A Well, it had different names, but it's Dr. Osdene's directorate.
Q At one point was it just plain research?
A Yes. In the beginning it was plain research and then narrowed down.
Q Now, putting aside for the moment what type of cigarettes were tested in those in vitro tests, are those appropriate tests to be performing on cigarettes?

0186

A I think I've testified some 14 times that yes, they are.
Q Are there any in vitro tests that were not performed while you were at Philip Morris that you felt should be performed.
A You know, from the literature and my previous experience at Lever Brothers where I was in charge of it, there were some tests that were predictive of -- for example, Philip Morris used hamster cells. You can use guinea pig ileum. You could use frog skin.
We did a whole bunch of testing where you take frog skin -- this is at Lever Brothers now -- and you measure the electrochemical force across the frog skin. If you then paint that with chemicals or apply chemical to it, the change in what you are

http://legacy.library.ucsf.edu/tid/otn05a00/pdf
Creative https://industrydocuments.ucsf.edu/docs/jjxd0001

measuring is an indication of how well something goes through the skin. This is used a lot for hand lotions and some shampoos and things of that sort.

And I remember talking with Dr. Osdene at one time thinking that might be a good model for the damage to the mucosal or throat tissue or even lung because it's going to be a measure of how readily the chemicals penetrate. That is one instance where I can think of one I would like to have seen, but

0187

that doesn't detract from what they did.

Q When you say "it doesn't detract," did you consider the types of tests done suited to the purpose that you understood them to be done for?

A Yes. For in vitro testing, they were suited and I think generally accepted by toxicologists as being the appropriate test to run for those kinds of reactions.

Q And in vitro testing, I don't know if I'm using a synonymous term when I say cell level testing.

A You can use that. Yes, most of it was.

Q Is there some in vitro testing that is not cell level testing?

A I just described one with the mouse skin -- pardon me -- the frog skin.

Q If you were to rank the type of testing that is most important in terms of determining toxicity, be it in vitro or in vivo or what have you, what is the most important type of testing in your view?

A Human testing.

Q That is actual testing that allows humans to use the product?

A Clinical epidemiology, yes.

0188

Q And can you rank them after that?

A Oh, yes. Then come animal models that have been correlated to be the closest to humans for various things. You know, for example, an eye irritation testing, the monkey is the closest to ours, so that would be closest.

And if you use an animal like a rabbit which doesn't lacrimate, you know, tears, that is kind of a test that is widely used but is kind of a severe test because the animal doesn't have a chance to wash out the chemical in their eye.

You start out with human testing and then models with animals that relate closest to humans. Rats turn out to be more like humans than sometimes we would like to admit in a biological sense.

And then the lowest level -- maybe not the lowest, but the second from the lowest is the in vitro test because those are just indicative. And then below that, the lowest level are chemical tests that have been shown to have correlation with either in vitro or in vivo tests.

Q Okay. And when you say human testing, does that encompass epidemiology, or is there more than epidemiology that you have within that category?

0189

A You can do it in a clinical setting in

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Courtesy of the Legacy Tobacco Documents Library http://industrydocuments.ucsf.edu/docs/jjxd0001

which case it's not, you know, epidemiology of a total population. You are looking at the effect of the clinical set of people.
Q Was that type of testing done at Philip Morris?
A Not at Philip Morris, no.
Q Was that type of clinical testing sponsored by Philip Morris?
A In a way, yes.
Q And what are you referring to?
A Selling products that weren't tested.
Q Okay. And epidemiology is the other form of human testing; is that right?
A Well, that's not a form. That's an analysis of what you do to a population that has been subject to the test.
Q Okay. Philip Morris did or sponsored animal testing outside of Philip Morris; is that correct?
A That is correct.
Q And that was throughout your time at the company?
A Yes.
Q And some animal testing was done at the

0190

company, for example, the De Nobele work with rats; is that correct?
A That's correct.
Q What is your understanding of the term "reference cigarette"? What does that mean?
A It depends on which one we are talking about, but basically a reference cigarette is one that the industry among themselves or in cooperation with various independent groups or agencies has agreed that they will formulate a cigarette in a certain way to be representative of some product that was possibly sold in the past.
Very rarely are there real products. It's just something we agree on. We will put so much Burley, so much different things, in the paper we will use a certainly porosity, certain length, and we will use that as sort of an indicator against which other cigarettes or things could be tested.
Q Okay. And the idea of a reference cigarette came up prior to your arrival at Philip Morris; is that right?
A Yes.
Q And reference cigarettes were used during your time at Philip Morris for types of testing; is that correct?

0191

A That's correct.
Q Were they used for in vitro testing?
A Yes.
Q And so reference cigarette would create the condensate which would be used in the in vitro testing?
A That's correct.
Q Were commercial cigarettes ever used during your time for that purpose?
A Not that I am aware of.
Q Scientists outside the tobacco industry, do they use reference cigarettes for testing

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Courtesy of http://tobaccoindustrydocuments.ucsf.edu/docs/jjxd0001

purposes on occasion, if you know?
A Yes.
Q What I mean is scientists not employed by Philip Morris, Reynolds, or one of the other manufacturers.
A That's what I understood. I think everybody puts a reference cigarette in their test -- not everybody, but it's generally done.
Q And reference cigarettes have been used, for instance, by the tobacco working group; is that right?
A That's correct.
Q And reference cigarettes have been used in

0192

numerous studies published in scientific articles; is that correct?
A That is correct.
Q Do you understand that scientists have a reason for using reference cigarettes?
A Several reasons, yes.
Q What reasons do you understand?
A My understanding is no one would agree to use branded cigarettes because you have to pick out whose brand it is and which one, and you certainly get into the problem of the information being divulged, you know, Marlboro or Winston or whatever. So there is political reasons, which is the main reason for not using a branded product.
Q And that is the reason why people inside the industry wouldn't use a branded product, right?
A Both.
Q Why would people outside the industry not want to use a branded product for political reasons?
A For fear of litigation, lawsuits, things of that sort.
Q How do you know that people outside the industry chose not to use branded products for that reason?
A How do I know? If you recall, when I was

0193

at Lever Brothers, we did all kinds of product testing. We had that discussion, I think. And if you did use a branded product, unless it was going to be for claims support for advertising or something like that, you generally kept that confidential from the viewpoint of liability.
In other words, if you said something about your competitor's products that the competitor doesn't like, you can get involved in a lawsuit. So it's better to agree either you don't do the research or you agree on something that everybody considers is going to be relatively harmless with regard to doing the test.
It still gives you the data; it's just that that data isn't going to be applicable to a specific product. So you can find out the results without really finding out the results.
Q Okay. I'm not sure whether I followed you. You said, "You can find out the results without really finding out the results." Were you referring to Lever Brothers?
A No. I'm referring to using a blind reference product that nobody actually sells. It

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Generated by unknown on 2013-05-17 industrydocuments.ucsf.edu/docs/jjxd0001

gives you the results that shows the carcinogenic potential of a cigarette in general or of that, but

0194

it doesn't answer the question whether a Merit is less harmful or potentially less harmful than a Marlboro, for example.

Q At Lever Brothers, you made reference to liability concerns, if I understand you correctly, that prevented you from testing against other consumer brands.

A No. It didn't prevent us from testing it. We did it all the time. Unless you really have your claims support correct and tested it many different ways, you would not make that public. We did it all at time. We made it public. We made a claim. "All outcleans them all." We tested that product against every other product.

Q My question is, do you know why scientists outside the tobacco industry use reference cigarettes rather than branded cigarettes in their testing?

A Other than from discussions with people in Philip Morris and the fact they didn't do it. Let's look at the two alternatives. One is they did it for some scientific reason.

Q We are talking about people outside the tobacco industry?

A Correct. So you have to ask yourself what

0195

that reason would be. I've never seen that articulated. With the tobacco working group, since the industry was part of that, it was basically that this is what we are going to do and avoided the confrontation with the industry.

Q Putting aside the tobacco working group, what is the basis for your knowledge scientists outside the tobacco industry didn't use branded cigarettes because of a fear of litigation?

A I gave it to you. We talked about my experience in setting up and running these kind of tests.

Q It's based on your experience at Lever Brothers and your reasons for not doing comparative testing publicly at Lever Brothers; is that right?

A That's correct.

Q That's the basis for your conclusion?

A That, plus most of the tests were funded by the industry.

Q Were there tests of consumer brands that were performed by scientists outside the tobacco industry that were published?

A Depends on what kind of tests we are talking about. There were some delivery tests performed by scientists outside, but in terms of

0196

actual brands being written in the final papers, I don't recall where somebody tested Marlboro versus Winston and published a result.

Q As you sit here today, you don't have any recollection of that; is that correct?

A I don't have any recollection of specifics. I have a lot of recollections of papers that are published that talk about brand "A," "B,"

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Digitized by the Legacy Industry Documents Library http://industrydocuments.ucsf.edu/docs/jjxd0001

"C," "D," or this, that, and the other thing.
The most likely source of that, by the way, is the Japan Tobacco and Salt where they did a whole lot of competitive publication of data. I don't recall where they had specific brands. They would use "A," "B," "C," "D."
Q Is one of the purposes of using a reference cigarette that you can control variables more easily to isolate the effects of a particular, say, ingredient?
A That is a belief held by people that aren't really familiar with cigarettes.
Q So you disagree with using reference cigarettes as a way to control for variables and determine the effects of one ingredient on the outcome?
A That's correct.

Q Why do you disagree with that?
A You have the same problem with a reference cigarette that you have with a branded cigarette. Here we sit in 1999. You can't make the same reference cigarette you made in 1972. You just can't do it. You don't have the same tobacco because it changes from year to year. This is a natural product. You don't have anything to peg it against.
You can think you are putting the same Bright and Burley into the cigarette, but it's different farms. It came from different growing regions, different climates, different crop years, over which you are talking different expanded tobacco. All the things are different.
So to me, it was sort of an artifice of something. It's better than nothing, but not as good as something which is sold in tremendous quantity.
To give an example, back to my Lever experience, everybody who tests shampoos in the sixties and seventies and even into the eighties used Prell as the control because Prell is the most widely sold shampoo.
So it would seem to me to have an analogy

of that, if you try to use Marlboro, you can go out and buy that at any time and know that Philip Morris is trying to keep that as much the same as they can from quarter to quarter, year to year.
So with the reference cigarette, as I say, it's better than nothing, but it's not extremely useful as far as quality control.
Q The same problems you referred to in reference cigarettes, which I will generally call variability in the cigarettes, do those same problems exist with branded cigarettes over time?
A Yes, they do. But the thing that you have going for you is that those brands, at least at Philip Morris, any change that was made on a quarterly basis, for example, in Marlboro were tested 10 ways from Sunday and consumer tests and delivery tests, a much more extensive level of testing to ensure that product was more similar than in reference cigarettes.

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Digitized by the Legacy Industry Documents Library - http://industrydocuments.ucsf.edu/docs/jjxd0001

For example, they didn't send reference cigarettes out to panels every time they made them to make sure that it was the same, you know, they smoked the same, gave the same level of satisfaction, none of that. So there is no real connection between the reference cigarette and the

0199

smoker.

Q Marlboros have changed over time; is that correct?

A They have.

Q And they have changed since the time you were at Philip Morris; is that correct?

A That's correct.

Q They changed in composition of tobacco?

A That's right.

Q They changed in terms of nicotine level, is that right, measured by the FTC methods?

A I believe the so-called Regular, which is the highest, that is 16 or 15 milligrams of tar, and 1.1 or 1.2, I don't think that one actually changed. The averages have changed, you know, Lights and Ultralights and all of that. If you look at the Marlboro Regular 85 and Regular 100, I think those have stayed pretty close to what they were when I was there.

Q Okay. Now, you indicated that you don't consider testing with reference cigarettes worthless. I don't have your exact words.

A It's worthwhile. As I said, I wasn't deprecating it. As I understood the question, you wanted to know what my druthers were.

0200

Q That is correct. In what sense is testing with reference cigarettes worthwhile?

A Some information is better than no information. Therefore, this represented a means of getting some information to see if, in fact, changes that we were making were -- whether, for example, carcinogenic or biological activity measured in the specific test, whether it went up or down compared to the reference. With all the problems that I associated, it's still useful to know whether the change you are making is in the right direction.

Q Is there any other benefits of doing reference cigarette testing other than what you just referred to?

A Yes. It allowed discussion more openly about the results, which if you use the branded products, as I mentioned earlier, people would be reluctant to do.

Q Any other reasons why testing of reference cigarettes was worthwhile in your judgment?

A No, sir.

Q Are you aware of any scientific literature reporting on comparisons between the biological activity of commercial cigarettes and reference cigarettes?

0201

A Yes.

MR. BROWN: What do you mean by "biological activity"?

THE WITNESS: In any of the above tests is the

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Digitized by the Legacy Industry Documents Library - http://industrydocuments.ucsf.edu/docs/jjxd0001

way I interpret it.
MR. BROWN: I make that objection because you may know it and he may know it, but this record won't reveal what you are both talking about. We both know you are talking about cancer, but it's not clear on the record.
BY MR. LOMBARDI:
Q What scientific literature are you familiar with in that regard?
A Japan Tobacco Company has published such results. I've seen such result even in some of the reports. They don't tell you necessarily the brand, but it's "A," "B," "C," "D" versus reference.
Q And let me ask the question another way just to make sure we are talking about the same thing.
What I am talking about is testing that has been done to determine whether reference cigarettes are representative of the in vitro testing that you would do with the commercial cigarette. Are you aware of any testing like that?

A Yes. To the extent that the reference cigarette gives the same polynuclear aromatic hydrocarbons, if they are effective in causing mutation in the test, then you can show that fraction from the reference cigarette caused it and the same in the branded cigarette. Those are the kind of tests I have seen without identifying what the products were.
Q Okay. And so you have seen those type of results reported where you can derive biological activity for a reference cigarette and biological activity for an unidentified branded cigarette and you can see there is comparability.
And so you are not suggesting in your testimony that reference cigarettes for whatever reason do not provide insight into biological testing you would do with a commercial cigarette?
A Insight is an excellent choice of words.
Q And are you aware of any studies that have been done and publicly reported that show that reference cigarettes are not representative of the type of results that you would get with commercially branded cigarettes?
A Biological tests.
Q Let's start there.

A Well, I mean the problem you have is since there has been a lack of published biological activities on branded cigarettes, you can't make the determination.
If everybody was publishing biological activity tests on branded cigarettes, then we could compare those results with the reference cigarettes in those same tests and answer the questions. There is not enough information to allow to you come to that conclusion.
Q So to try to get to the bottom line here, you don't know of any tests that have been done that indicate that the commercial cigarettes -- or strike the question.
You are not aware of any tests that have

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Source: http://industrydocuments.ucsf.edu/docs/jjxd0001

been done that indicate reference cigarettes are not representative of commercial cigarettes in the biological testing that we've discussed for the reasons you enumerated?

A Well, what I am saying is that there is not a sufficient number of those tests that have been done, basically, because the industry didn't do them, which they should have done. There is not enough information. I agree there is not enough information.

Q I want to know if there are any reports out there. You say there are reports where they did a comparison. Has anybody else outside the industry done that type of comparison and reported the results in literature?

A Okay. First of all, let's clarify. I think I testified earlier there are results from Accord, Premier, and Eclipse.

Q Let's put those aside.

A And I testified earlier I haven't looked at this in preparation for this deposition, but there is about a box with 20 pages of patents where a lot of this comparison stuff is made.

If you include Japan Tobacco and Salt as part of the industry, which I do, then some people have done branded cigarette comparisons and found differences between that and reference cigarettes. If you look at the graphs that are in a lot of that data, the reference cigarette is clearly different than the Marlboro than the Winston.

I think there is enough information without knowing exactly which ones are which to conclude that reference cigarettes in biological activity tests are not representative of cigarettes that are sold.

Q Are these Japan Tobacco patents you are referring to?

A Patents and papers, yes.

Q Can you be specific as to which patents and papers you are referring to?

A There is one on nitrates. There is one of them that show graphs of all these dots scattered all over for different biological activity indicators.

And even if it didn't have a reference cigarette in it, when you see 10 or 14 brands that look like somebody took a shotgun and shot it at the page, you can determine that there is no one cigarette you are going to make that is going to capture how all of those cigarettes are behaving in that test.

Q Okay. Can you be specific as to which Japan Tobacco patents you are referring to?

A I can't be as I sit here because they have been presented before. They have been talked about before. I don't have them with me.

Q When you say "before," you mean in your testimony before?

A I mean in testimony or in boxes or in some papers.

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Digitized by the Legacy Industry Documents Library - http://industrydocuments.ucsf.edu/docs/jjxd0001

Q Are they in your two original boxes of reliance materials?
A I think what is in the two boxes of reliance materials is about a 20-page document which lists the papers.
Q Japan Tobacco papers?
A That and everybody else. It's all the patents on safer cigarettes. Remember I testified to this before? I did a literature search on all of the patents that have been issued with regard to safer cigarettes.
The reason why patents are important is because you have an obligation under patent law to disclose everything you know about the thing that you are doing. So that is where they had to put down as to how these things worked, the branded products against each other.
Q All I'm interested in is getting a list or an indication of where I should look to find the patents and papers you say show the difference between results for reference cigarettes. One you say is Japan Tobacco papers.
A Right. And it's contained in a much larger amount in my list. It's about 18 or 20 pages that you should already have that is a printout of a

0207

literature search only by title, unfortunately, because it went on for pages.
Q So there is this 19- to 20-page paper I'll find in your reliance materials from before?
A Right.
Q Is there any other source I can find for the difference between the performance of reference cigarettes and commercial cigarettes in biological testing?
A It seems to me I have seen other such documents on the websites, but I don't recall. I can't be specific.
Q There is nothing specific you can point to right now?
A No.
Q Now, let me take the opposite question, which is, have you seen any patents, papers, or publications that study the performance of reference cigarettes and commercial cigarettes in biological testing and conclude that the results are comparable?
A I think I've answered it, but I'll try again.
Q Okay.
A To the extent that the types of chemicals

0208

are the same and the types of response in the tests will be similar, it just doesn't tell the magnitude of the response.
Q Let me make sure I'm being very specific here. I'm asking whether you are aware of any papers, publications, or patents that purport to compare the performance of reference cigarettes and commercial brand cigarettes in biological testing and conclude that the two cigarettes produce comparable results?
A Yes, I'm aware. I think there was some

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Generated by unknown on industrydocuments.ucsf.edu/docs/jjxd0001

stuff that came out of the early tobacco working group where they did some of those comparisons or said they were comparable. I'm trying to define for the purposes of the testimony the level of comparability because it doesn't mean identical.

I think there is work done as part of the various studies in Europe for some of the data involved in the Hunter commission reports and the German government. There is a series of papers that look at this and accepts the hypothesis that we can look at a reference cigarette and get a good enough idea of what toxic effects we are dealing with.

Q So now we have the European and particularly the German work. Is there anything

0209

else that you are aware of as you sit here today?

A I can't think of any right now.

Q Okay. Dr. Farone, you have testified before that you are aware of a report issued by six toxicologists concerning additives to tobacco.

Do you recall that generally?

A I do.

Q Just so we have a frame of reference, when you use the term "additive," what are you referring to?

A Anything that isn't tobacco.

Q And is put in the cigarette, obviously?

A Correct.

Q Have you indicated in the past -- correct me if I'm wrong -- you don't agree with the conclusions of those six toxicologists; is that correct?

A That's correct.

Q Okay. Why do you disagree with their conclusions?

A First of all, if you are going to inhale something -- I've been through this ground many times -- it has to be tested by parameters that are suitable for inhalation toxicology. I showed you a paper from the Center for Disease Control that comes

0210

to the same conclusion.

The second hypothesis is that they are delivered unchanged, which depending on the discussion we have today, if nicotine is changed to a large extent, then I think we have to question whether that is true.

Q When you say "delivered unchanged," you mean the additive is unchanged from the presmoked condition to the condition it's in in the smoke?

A That's correct. So, for example, if you put menthol in a cigarette, what the smoker gets is exactly the menthol you put in there and isn't changed.

Q And you had a third reason?

A And the third thing is a lack of recognition. The components that we are talking about are usually added in connection with something else.

You know, for example, when we put chocolate in a cigarette, the main chemical associated with chocolate is theobromine. It's an alkaloid, just like nicotine is associated with

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Courtesy of the Legacy Tobacco Documents Library http://industrydocuments.ucsf.edu/docs/jjxd0001

tobacco. There could be some other compounds you would like to identify as being chocolate.
When you put it in with all the rest of

0211

the materials, then you have to look at the decomposition products of what you put it in with, not just with the material that you put in itself that may distill, but by the way you put it in.
You could, in fact, incorporate other compounds which result in toxic materials that you are bypassing in your analysis.
Q What is your understanding of the testing that the six toxicologists actually did do?
A My understanding is they didn't.
Q Did they do any testing?
A This is for the Massachusetts -- it's more of a paper evaluating them and kind of saying, "Well, they distill unchanged, and the levels don't appear to be in harm."
Q Do you agree there was a paper created by six toxicologists in 1994 relating to additives to cigarettes?
A I think we are talking about the same one. It was also provided to the state of Massachusetts. I think it's the same. It's in my box.
Q Did you understand that the toxicologists did not do any testing in arriving at their conclusions?

0212

A I don't recall any new testing in that paper. I recall discussions of it talking about 90 percent of the flavors being delivered unchanged and itemizing some of them and said they are within safe limits.
Q Is it your understanding that in arriving at their conclusions they did perform testing?
A I don't recall right now.
Q Okay. Is it your understanding that the toxicologists did not do inhalation toxicology experiments?
A That's my understanding.
Q Do animal tests, animal inhalation, fall within inhalation toxicology experiments?
A Yes.
Q And it's your understanding, I take it from your testimony, that the toxicologists did not do any testing reflecting a recognition of the various additives combined in various forms; is that correct?
A It's my understanding that they did not combine -- they did not test, for example, nicotine with acetaldehyde with theobromine with the different compounds as would be delivered from a cigarette.

0213

Q Did you know any of the six toxicologists?
A I believe I knew or had seen the names of two of them. Don't ask me.
Q John Doull?
A I don't remember now.
Q D-o-u-l-l?
A I don't recall.

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Digitized by the Legacy Industry Documents Library - http://industrydocuments.ucsf.edu/docs/jjxd0001

Q Are you familiar with any of their reputations within the field of toxicology?
A No, I'm not.
Q Okay. Are you familiar with the fact that at least one of them is widely considered the father of toxicology? Have you ever heard that said?
A No.
Q Okay. Are you familiar with how many textbooks they have written?
A I'm familiar with some of the textbooks they have written.
Q Do you have any reason to believe that these six toxicologists were not reputable scientists at the time they did their work?
A Well, I don't consider the report to be the result of a reputable scientific study. That does not mean the people doing it weren't reputable because in many cases reputable people will

0214

undertake to do a study in a very narrowly defined area, which there is nothing wrong with that.
If you ask somebody to do a study to measure a specific parameter and you just contract with them to do that, that is what their scope of work is, to measure that one parameter. They may not be obligated to or empowered to or may not have to or want to discuss it outside that narrow context in which you did it.
Q Okay.
A So I am not impugning their reputation. I'm just saying the work as presented for the purpose presented I thought was totally inadequate.
Q You don't know the circumstances under which they were hired?
A I do not. And out of the contract, I couldn't say. When I was asked about that, I was given this and asked, "What do you think about this as a paper that purports to prove why additives are safe?"
Q Okay. Do you have any reason to doubt the integrity of these particular scientists?
MR. BROWN: You already asked that.
THE WITNESS: I indicated no, I don't.
BY MR. LOMBARDI:

0215

Q Okay. What testing is done on additives at Philip Morris?
A Today?
Q Yes.
A I don't know.
Q Do you have any knowledge of any testing done on additives at Philip Morris since the time of your departure from the company?
A Yes. As results of the various litigation, I've seen several reports.
Q Okay. Other than what you have learned through the litigation, do you have any knowledge of what type of testing Philip Morris does on additives?
MR. BROWN: Today?
BY MR. LOMBARDI:
Q Since the time you were at Philip Morris.
A There are a couple papers I think I have

http://legacy.library.ucsf.edu/tid/otn05a00/pdf
Digitized by the Legacy Industry Documents Library - http://industrydocuments.ucsf.edu/docs/jjxd0001

seen.
Q Were these written by Philip Morris personnel?
A I don't recall whether they were written by Philip Morris personnel or sponsored by Philip Morris. I don't remember the exact nature.
Q When you say "papers," are you referring

0216

to an internal Philip Morris document or something else?
A I'm referring to published articles, whether it was, you know, some tobacco journal or Coresta. I'm vaguely aware there have been several publications on additives.
Q What have you learned about the testing Philip Morris does on additives through whatever articles you have reviewed?
A I have not seen any testing of additives ever branded cigarettes with and without the additive and the kinds of toxicology tests you would normally associate with trying to find out whether an additive was okay.
Q Okay. What are the types of toxicology tests that, in your opinion, should be done to determine whether an additive is, as you say, okay?
A Okay. Maybe a specific example would help. Let's take Marlboro with and without St. John's Wort, which is one of the ingredients. You should test that separately, the St. John's Wort.
Q That is the additive you are using as your example?
A This is an example. They may not still

0217

put it in there. Let's assume for the sake of an example they do. You test that additive by inhalation decomposition. You are going to be burning it in the cigarette.
Q Is that different than pyrolysis when you say decomposition?
A It could be partial pyrolysis. Cigarettes don't just have pyrolysis or combustion. It's a combination of both. You try to burn it under conditions you can measure. You measure it against a cigarette and against the background and look at any constituents of St. John's Wort. There are three separate tests.
Q We have in vitro, in vivo, and what was the third one you said?
A In both of those tests you test the products, the cigarette product with the ingredients.
Q Okay.
A The burned ingredients alone, and as per the six toxicologists, any presumed distillable that you are expecting to come off that intact. So in chocolate, for example, if you expect theobromine to come off, you would test the theobromine.
Q Any other toxicological testing you would

0218

consider appropriate?
A That would be very useful.
Q Okay. Anything else that comes to mind

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Digitized by the Legacy Industry Documents Library - http://industrydocuments.ucsf.edu/docs/jjxd0001

concerning additives specifically?
A No.
Q Okay. Are you familiar with any published literature that studies additives in tobacco and concludes that a particular additive or other additive is harmful in the amounts received through smoking?
A Yes.
Q What?
A Well, we just got through with the whole TLV discussion. That is the purpose of the analysis.
Q Here is what I am asking: I'm asking if specifically has there been literature that specifically deals with additives and the safety of additives that has concluded that under the conditions of use those additives are unsafe?
A Well, what I am saying is that if you take theobromine -- I don't know if that is a good example. Let's see if I can find one. Let's take acetaldehyde.
Q Let me just restate my question. I don't

0219

think you need to go into an example.
I'm asking, has there been a study done of additives that has concluded that additives in cigarettes are unsafe under the conditions used? Has there been that kind of publication that you are aware of?
A No. I think I testified before that the fact that there isn't such a study should preclude the cigarette companies from marketing it because they should have performed those studies.
Q I understand. I'm asking the fundamental question first. I have to start someplace.
Doctor, is there a study that you are aware of that concludes that additives under the conditions of use in cigarettes are unsafe?
A In some cases, yes.
Q And in some cases, are you referring to with some additives?
A Yes.
Q First tell me an additive, and then tell me the publication where that finding is made.
A Okay. Any additive which results in increased levels of heavy metals, I think there is a generally accepted consensus that it would be unsafe to incorporate radioactive materials in cigarettes.

0220

Q Okay. You say there is a consensus. Is there some article that deals specifically with additives to cigarettes that contain heavy metals?
A Published article?
Q Yes.
A No.
Q Any unpublished article that you are aware of?
A Yes. The work done at Philip Morris to measure and eliminate from use those materials which would cause those things to be incorporated.
Q You are talking the polonium 210 story you testified to before?
A It's just not polonium 210; it's any

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Downloaded from industrydocuments.ucsf.edu/docs/jjxd0001

radioactive material.
Q We are talking about additives that are in publication that have been studied, and the conclusion has been reached those additives aren't safe under the conditions of use. You have mentioned heavy metals.
A Potentially unsafe. To get back to the specific, there is no one that I am aware of where they carried it through to the logical conclusion by doing the test to, in fact, provide evidence it was the additive that caused the result.

0221

Q Okay. You have referred to heavy metals as one set of additives on which you have seen papers in house at Philip Morris and that you worked on.
A I didn't work on it, but I've seen papers there.
Q What other additives are you familiar with that have been studied and been the subject of reports concluding that they are unsafe under the conditions of use?
A Coumarin, that is a very famous one.
Q Was coumarin still in Philip Morris cigarettes at the time you were in the company?
A No, it wasn't, but it was in the competitive cigarettes.
Q I'm interested in Philip Morris.
A Pesticides.
Q What pesticides are you referring to?
A Things like dieldrin, aldrin, those types of pesticides.
Q Were those studies specifically in the context of their addition to cigarettes and their safety under the conditions of use in the cigarette?
A As I recall, that is a little fuzzy

0222

because it was kind of on the outside, but I do recall these conversations. I actually took a trip out to California with Dr. Osdene and Dr. Seligman and visited the producer of methoprene which was an additive used to stop the tobacco beetle from destroying cigarettes.
We don't have a situation where it's safe without it and it's dangerous with it. We are talking about something that is basically toxic to start off with. What we are talking about is increasing or decreasing the level of toxicity.
So you are not going to prove that the single individual compound or additive caused a particular problem because the problem is so generic. You are going to presume that you don't want it in the cigarette because certainly it's not better if you put it in the cigarette.
Q And that's true for each of these categories of additives that you listed for me?
A That's correct.
Q So we have pesticides, and you were aware of some discussion at Philip Morris about the pesticides you just listed for me at the time you were there?
A That's correct.

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Digitized by the Legacy Industry Documents Library - http://industrydocuments.ucsf.edu/docs/jjxd0001

0223

Q Has that been the subject of any outside articles -- strike the question.

Has the safety of those pesticides as additives under conditions of use in a cigarette been studied in any outside articles that you are aware of?

A Well, they certainly are known. It's been mentioned in outside articles that tobacco contains pesticides. Some of the state universities have done work on that, including the amount that is in the smoke.

Q Anything specific come to mind?

A No.

Q Any other additives? You have given me heavy metals, coumarin, and pesticides.

A These are only examples of additives where I can recall the paper where it has been studied.

Q Correct.

A I don't know if you want to call nitrate as an additive. That is certainly an additive we know a lot about.

Q Were there publications on nitrate as used in cigarettes?

A Lots.

Q Were there publications on nitrate as an

0224

additive and whether it was safe with use in a cigarette?

A No determination of safety was made.

Q Any others? Heavy metals, coumarin, pesticides, and nitrate so far.

A No. We would have to go back through the list. I don't know how we are classifying that.

Q I'm going under your definition of additive.

A That's fine.

Q Has the surgeon general made any findings with respect to the safety of additives under the conditions of use in a cigarette, to your knowledge?

A I don't recall.

Q That's all for now.

EXAMINATION

BY MR. FURR:

Q Dr. Farone, my name is Jeff Furr. I represent R.J. Reynolds. I want to ask you some questions specific to R.J. Reynolds.

Have you discussed with Plaintiffs' counsel the opinions or testimony that you might offer in this case regarding R.J. Reynolds as distinct from Philip Morris?

0225

A I don't believe so.

Q What opinions are you prepared to offer in this case with respect to R.J. Reynolds and cigarette design?

A They are similar to, as you are probably aware, the Neri deposition. We went through that. That is R.J. Reynolds. So they are very similar to that. I don't think there is much difference between this and that.

MS. CHABER: Okay. Are you done?

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Generated by tobaccoindustrydocuments.ucsf.edu/docs/jjxd0001

MR. FURR: Not quite.
BY MR. FURR:
Q Dr. Farone, take a look at what we marked as Exhibit 9. Tell me if that is a copy of your Neri disclosure.
A It appears to be, yes.
(Defendants' Exhibit 9 was marked for identification, the original of which is attached hereto.)
BY MR. FURR:
Q Let me ask you to take a look at the second paragraph, the second sentence, when you state:
"The cigarette manufacturers, including R.J. Reynolds Tobacco Company, have failed to

0226

use this advanced technology to design and effectively market cigarettes that could reduce diseases caused by smoking."
Do you see that?
A I do.
MR. BROWN: What page are you on?
MR. FURR: Page 1.
BY MR. FURR:
Q What technology are you referencing there?
A Any and all of the technology that either I have disclosed as being available to industry and these publications and/or that Reynolds has disclosed as being available to the industry.
Q Well, I would like for you to list with as much specificity as you can the technology that Reynolds had available to it that it failed to use to design and effectively market cigarettes that could reduce diseases caused by smoking.
To make it a little more convenient, take a look at what we marked as 10 and tell me if that is a copy of the presentation you mentioned.
A That is correct.
(Defendants' Exhibit 10 was marked for identification, the original of which is attached hereto.)

0227

BY MR. FURR:
Q Would you direct me in this presentation to the technologies you mentioned a moment ago that Reynolds has failed to use to design cigarettes?
A If you would turn to the third page, please, this is in all of my testimony in the past. What I first do is to identify the key problem components. You will see those listed: nitrosamines, aldehydes, polynuclear aromatic hydrocarbons, metals including radioisotopes, and carbon dioxide and nitrogen.
And then I state:
"The technology exists to reduce all of these compounds. In the case of nitrosamines, carbon dioxide, and nitrogen, they can be virtually eliminated."
In the rest of these, what I do is discuss in different categories what the technologies are, and I start by talking about how you should test the products to start off with.
So let's talk about right here in the

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Digitized by the Legacy Industry Documents Library http://industrydocuments.ucsf.edu/docs/jjxd0001

first line, "Test all brands as marketed in the battery of in vivo and in vitro tests and publish the results." So we are talking about brands as marketed.

So that is technology easily available. You can just do it. So if you did that, you would know whether a Winston was safer than a Camel or safer than a Marlboro.

At least in these tests you don't know exactly because you haven't done the human testing, but that is technology available to Reynolds that they could have and should have used to determine whether or not their products are safer.

"Publish data on the chemical composition of smoke with regard to key components by brand." To my knowledge, the only place this has really been done is with Eclipse and Premier and to a certain extent with Accord.

I see data that has been done at Labstat and other places that Reynolds has had done which I thought was very, very helpful because it shows reductions in all of these different materials. So if you did that for all your products, that would be helpful.

Q Excuse me. How would that be helpful in assisting Reynolds in designing and marketing cigarettes that were safer and reduced the amount of disease in smokers?

A You would know which one of them scored

the least in these tests.

Q Who would know?

A Reynolds would know.

Q Does Reynolds already know?

A I don't know. They haven't done it as far as I know. They haven't published it.

Q Have they done the type of testing you are referring to?

A No. By brand?

Q Yes.

A No.

Q How do you know?

A If you have done it and haven't turned those documents over, I think you are in violation of some law or another. I don't know. But I haven't seen any papers that Reynolds has turned over in my role as an expert that says that has been done.

Q Have you reviewed all of the discovery responses by Reynolds in the past 10 years?

A No, I haven't.

Q Okay. Go ahead.

A But I'm hoping that if it's available for this case, I'll get to see it.

"Do not use FTC smoking methodology."

There is a requirement, I think, to do testing in an appropriate way. That is to smoke these cigarettes in a manner which humans tend to smoke it. All companies have human smoke simulators.

So you publish information concerning what the yields are, deliveries of both tar and nicotine

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Source: http://industrydocuments.ucsf.edu/docs/jjxd0001

in these chemical compounds, on the basis of some realistic smoking profile. That is technology available to Reynolds. You could easily do that.

Q Let me stop you. You do not mean to not use the FTC smoking methodology if companies are required by law to?

A Correct.

Q You mean do additional testing?

A Not as the basis of your product testing right now.

"Measurements based simply on whole smoke (tar plus gas phase) evolved from cigarettes under differing smoker profiles."

This gets to the problems of the gas phase and all the games one could play with what is delivered and what is not. If you track everything that comes out of the back end of the cigarette under different smoker types and we use the whole smoke and test that, that is going to be much better

0231

for understanding what is delivered. Then we can stop spending hours at depositions talking about gas versus mainstream and all that stuff.

Basically, in any product that you expose a human to, you want to know everything they are exposed to, not just part of it. That is the whole smoke.

And the next one is very simple, to have your protocols have the kind of credibility that would allow you as a company to understand whether they are acceptable or not.

You develop and discuss them. Organizations do this as part of their way of life: the Association of Official Analytical Chemists, the American Society for Testing Materials.

What I see a lot of in the industry is everybody makes up their own tests and use it internally, and it's one big secret we don't tell everybody about. If the methodology and protocols for biological activity testing we are talking about here were discussed openly and we all agreed use the same nine or 10 protocols, that would be a real step forward.

Q Is there a consensus among these

0232

organizations as to what biological tests should be used to evaluate cigarettes?

A No. That is why the discussion never came up. You first have to have the discussion. It's within their technical grasp, and all they have to have is the desire to do it.

If you go to these guys and tell them you want to develop standard tests, I am pretty sure they would be more than happy to work with Reynolds to do that.

Q Do you know that Reynolds never made those type of overtures to these organizations?

A I don't know that they haven't, no.

Q Okay.

A Next page?

Q Yes.

A Now, we just talked about the things you

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Source: http://industrydocuments.ucsf.edu/docs/jjxd0001

can do to tobacco. Any of the companies can tell the government that as of such and such date they do not want to have nitrates in the tobacco they purchase. It doesn't cost Reynolds a thing. They have to let their wishes be known to the farmers and everybody.

Q Let me ask you a question about that. Do you have any knowledge or awareness of a program

0233

recently started at Reynolds where Reynolds has been working with farmers to assist them in curing tobacco in a different fashion in an effort to reduce nitrosamines?

A I certainly do, and I applaud you in that effort. That is one of my suggestions for things to do.

Q You do think that is a beneficial step Reynolds is taking, and you think it's likely to result in a decrease in nitrosamines in tobacco, don't you?

A I'm fairly certain it is.

Q Okay.

A "Screen fertilizers for radioactive isotopes." Since that seems to be the source, that is pretty easy to do.

Here is the one you were just talking about. "Air curing of Bright tobacco to replace Burley tobacco." We know a lot of the nitrosamine problem -- not all of it, but a lot of it -- is involved in the curing process.

I guess you are aware that Philip Morris had patents on air curing, and I have always been a proponent of reducing the TSNA and toxic materials in tobacco. That is the next one. "Use strains

0234

with virtually no TSNA."

Q Tell me what you do know today about the program that Reynolds has developed to assist farmers in curing tobacco in a different fashion.

A It has to do with curing the way they used to do it rather than the way it's been done recently.

Q Do you know that Reynolds did research and found tobacco cured in one manner was better than tobacco cured in other manners?

A That's correct.

Q And you know that Reynolds went out and purchased the type of equipment that farmers would need to use to cure tobacco in a manner that would decrease the tobacco nitrosamines and essentially gave that equipment to farmers?

A I'm aware generally of that.

Q Okay.

A My point is you can produce tobacco with virtually no TSNA. It's been done. So you could have genetic strains and manipulate it to decrease the TSNA. That is a possible thing you can do.

And I'm aware in the early eighties that Reynolds did, in fact, have programs to change the strains of tobacco just like Philip Morris had

0235

programs. Here we are 20 years later and I'm still waiting for the implementation. And then there is

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Source: http://industrydocuments.ucsf.edu/docs/jjxd0001

Y-1.
Q Tell me what you think about Y-1. Had the company gone ahead and used Y-1 tobacco, would that have had a positive or negative public health effect?
A Let's go back to the seventies. I testified to that ad nauseam. In the seventies there was a presumption, a hypothesis, that if you decreased tar, you would decrease diseases caused by smoking.
In order for that to be effective, you had to increase the nicotine contents relative to the tar. So Philip Morris had several ways of doing that. Merit was a higher Burley blend, and I think Reynolds did much the same thing, increased the Burley content.
To the extent Y-1 could have been a higher nicotine cigarette without the negatives of Burley because Burley is the source of many of the nitrates and nitrosamines, that could have been a step forward.
And now 20 years later, having performed the largest epidemiology experiment we know of, it

0236

didn't work. When you reduce the tar by 50 or 90 percent, there is still enough toxic materials left in the tar that is left to not see any reduction and some people think possibly an increase in certain types of lung cancer.
So we did it and didn't do enough, and that goes back to the first page. We didn't know we didn't do enough because we didn't do the testing we should have done when I was at Philip Morris.
Q There was really no way for the companies to do the type of human epidemiological testing that you are suggesting other than what was done, was there?
A We are not talking about human epidemiological testing. I'm talking about doing a product testing like we talked about. If somebody had looked at, say, Winston Light or Ultralight in these tests and compared it to Winston Regular and saw the same number of animals got cancer, we would say maybe that isn't enough. Maybe we have to take out more. Maybe we have to do something different.
Epidemiology by brand, that isn't being done that I know of. I'm advocating that because I think it's a good thing to do.
Q What were you referencing when you said

0237

the same number of animals had gotten cancer with one brand or another, are there positive inhalation studies where tobacco smoke has, in fact, been shown to produce increased numbers of cancers?
A Going out all the way back to the late fifties, we can argue whether they were done correctly and all of that. The biggest animal studies proving cigarette smoking causes cancer is done in humans. It's called epidemiology.
Q And that is why?
A You can't wait 20 years to wait and see if you made a mistake or not. We have to find the next best battery of tests. I don't want to get into

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Digitized by the Legacy Industry Documents Library - http://industrydocuments.ucsf.edu/docs/jjxd0001

toxicology. We don't have the time for it, and I'm probably not the right person.

I supervised them and worked with them. We set up inhalation tests for shampoos and hair sprays. We can argue the merits. That's not what I'm interested in. I'm interested in picking something we can agree on industrially. Doing nothing is wrong. Doing something, even if we are wrong, we at least will have the insight that we are moving in the right direction.

Q I'm not going to debate all the nuances of the toxicology studies with you. Let me ask you one

0238

question, though.

Isn't it true even today's surgeon general says there is no animal inhalation model for lung cancer in smoking?

A I can answer that question with just saying yes. I would like to point out, is the surgeon general an inhalation toxicologist, to turn the question around?

If the approach was taken by the industry that we would like someone to tell us what test to use and I think probably as little as probably a couple hundred thousand dollars as a reward for coming up with something that could be published and peer reviewed and be accepted, I think you would find a lot of takers.

In other words, I don't think the excuse that somebody else hasn't determined what test to run is a good excuse. The technology is available to run those tests. To my knowledge, none of them were run.

Q Tell me what you know about the biological testing of cigarette products at R.J. Reynolds in the past 10 years.

A Well, I know that it was basically in vivo testing similar to Philip Morris's. I know that in

0239

a previous deposition I did for Reynolds where I was asked whether there was any proof that R.J. Reynolds sent their stuff offshore so it wouldn't be found in the United States, I said I didn't.

By now you know I do. I know they sent their research offshore to be done just like Philip Morris did. So they didn't do any animal testing in the U.S.

Q Your understanding is there has been no inhalation studies done by R.J. Reynolds in the United States?

A At the Reynolds facilities. I haven't gone back through to see what they may have participated in either by themselves or with other independent laboratories. I'm talking about in the Reynolds facility in the U.S. at Winston-Salem, just like I'm talking about Richmond.

Q Have you ever asked a scientist at R.J. Reynolds whether or not those types of tests have been done?

A No, I don't believe I have.

Q Okay. All right. Let's keep going down your list.

A "Use strains high in cellulose." That is

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Courtesy of the Legacy Tobacco Documents Library http://industrydocuments.ucsf.edu/docs/jjxd0001

for the reasons we discussed earlier.

"Use strains with Nicotine as the only alkaloid." We don't have to worry about nornicotine and the rest of it.

"Use strains that do not concentrate or collect nitrates or heavy metals."

Q Okay.

A "Tobacco Processing," the first one is "Extract all alkaloids, remover TSNA, nitrates, and reintroduce purified nicotine." That would totally eliminate the tobacco specific nitrosamines.

Philip Morris had a way to do that with CO2. Reynolds was working a different way by using an extraction with other solvents. In fact, I believe they did have successful technology for doing that.

Q Why do you believe that?

A Quite by accident I received a piece of equipment in my laboratory that was shipped to me from Winston-Salem that still had threads of tobacco in it and a device that was designed by a company in Australia for doing these kind of extractions.

It was about the time that Philip Morris had introduced Next. I know Reynolds was working on it. I know that company could not talk about it. The company was called Process Technology, Incorporated. In their opinion, the tests at Reynolds were highly successful. I'm relying on that.

Q Okay. Let me ask you about this reintroducing purified nicotine. Would you characterize that as an exercise in nicotine level manipulation?

A Of course.

Q Obviously, you think that would be a good thing if done properly and complied with these other technologies?

A Let's remember that the tobacco industry manipulated and didn't make a value judgment. And the tobacco industry came back and published 40 papers and said they never did that. Then it was said, "If we did it, wasn't that a good thing?" "Yeah, you did it, and I'm not saying it's a bad thing."

Q Okay.

A Now we get down to "Reduce the use of Burley tobacco." I think we all know that is more biologically active than Bright.

Q Why is Burley tobacco used?

A Burley tobacco is used because of the higher nicotine level, among other things.

Q Does it affect taste characteristics of cigarettes?

A Yes, it can affect taste characteristics, but there is all kinds of patents available as to technology on how to simulate Burley tests. We just saw one, Cliff Lilly's patent.

There is technology available to cover for deficiency in Burley without a taste problem but still benefiting from the lower biological activity

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Source: http://industrydocuments.ucsf.edu/docs/jjxd0001

of Bright tobacco.
Q Before we leave that patent issue, have you ever made any type of systematic review of the patents that R.J. Reynolds has taken out on inventions used in cigarette design and manufacturing?
A Yes, I have.
Q When did you do that?
A Well, I did it twice in my career. Once was part of litigation early on -- that wasn't even litigation. I think it was at the time I was helping FDA. Another time was before I left Philip Morris.
Philip Morris and Reynolds had patent lawsuits going back and forth. We kept very close track of everything that Reynolds did. The most

0243

recent time, I think, was probably '94 or '97.
Q Are those patents in the boxes you have been referring to as your reliance materials?
A I believe it's in the list of the 18 or 20 pages I referred to earlier.
Q Okay.
A And, again, here we talk about additives, "Eliminate the use of additives," and I'm trying to be specific here. The problem for nitrosamines or for some of the worst chemicals are the ones that contain proteins or amino acids.
"Use more expanded tobacco." We all know about that one.
"Decrease additives and sizing on reconstituted tobacco or eliminate it." Originally, reconstituted tobacco, when it was put in, was a real advance because it was mostly cellulose and had lower biological activity.
In the attempt to get the squeal out of the pig and use every bit of scrap material available, certain things are put back into reconstituted tobacco that would be better if left out.
So basically, what I am saying is you don't want to use additives in your reconstituted

0244

tobacco. If I'm not mistaken, Reynolds has a process with which it can mix sheet with minimal or no additives associated with it. So that is one thing that is technology that is available that you may already be using.
Q That's my next question. Is Reynolds using that technology?
A I don't know because I'm not there, but I know it is available to Reynolds.
Q Has Reynolds increased its use of expanded tobacco?
A Up to the point of the capacity of its plants, I believe it has. It doesn't mean you couldn't make more expanded tobacco plants.
The next page is "Filter Technology."
Q Keep going.
A "Use charcoal filters." You all know from my previous testimony with regard to the Japanese. It's very clear from the epidemiology the widespread use of charcoal reduces many of the compounds

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Digitized by the Legacy Industry Documents Library - http://industrydocuments.ucsf.edu/docs/jjxd0001

implicated in causing cancer. And it is the most plausible explanation for the reduction of lung cancer rates among the Japanese.

Q You have been deposed on that issue.

A I testified at trial with regard to that.

0245

You can go read it and pick it apart.

Q Let me just ask you this: Since the last time you testified on that issue, have you developed any additional thoughts as to why charcoal filters are the most logical or likely reason for the difference in the epidemiological risk of smoking in Japan versus the United States?

A Actually, the logic in there has been strengthened because as the Japanese are having a lesser and lesser influence in the selling of their cigarettes as compared to American style cigarettes, the lung cancer rates have started to go up.

So I think there is developing epidemiology that is going to prove more strongly this particular point. I think there is one in here about China, and there is one I got recently that my wife found on Korea. They are starting to do epidemiology studies in these countries other than the U.S.

We are all aware of patents that have been issued on selective filters. There is all kinds of different filters that have been used. They require a commitment to putting those in and then modifying it in order to make it be the same or better than it was originally.

0246

And I contend that the only reason why that hasn't been done is because the industry doesn't want to do it. It's not because they don't know how to do it. They just don't want to do it.

Q Have you ever talked to anybody at Reynolds about whether they have investigated whether they can use the combination of different filters and different flavors to achieve products that are accepted by consumers to the same rate that their current products are?

A I have read a lot of the information at Reynolds about the work that has been done on selective filtration in documents I have seen. I haven't talked with them much. The point is that the technology is available. So then you set an objective to go ahead and do it.

Q What evidence do you have that the available technology can be used to produce products that consumers find acceptable?

A Well, we started off by talking about charcoal filters. A lot of consumers will find that acceptable, and some of them won't. There is a consumer test that shows that the Lark wasn't liked as well as the Marlboro, but there is other differences between those cigarettes. Has anybody

0247

sold a Marlboro or a Winston with a charcoal filter?

Q Are you still answering the question?

A I'm answering the question. They haven't done that. They haven't tried to go in and modify that and change it to, in fact, make it acceptable.

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Digitized by the Legacy Industry Documents Library - http://industrydocuments.ucsf.edu/docs/jjxd0001

You have to go through consumer testing and things of that sort.

Technology is available. We know at least there is a plausible logic as to why that works. If we did the project testing up on the front page, we would have more evidence as to why it works.

Q Before we go on, I want to go on to my question. You gave a lengthy answer. I'm not sure you answered the specific question I asked.

What evidence do you have that technology is available to use to produce products that consumers find acceptable?

A Well, I answered, I thought, by saying, first of all, the Japanese find the charcoal filters acceptable. In the United States no one has tried to market with the same level of intensity.

We have tried to market charcoal filters. Don't get me wrong. But in a discussion we had, if you compare the budgets, it's a matter of a corporate decision saying, "This is good. We are

0248

going to do it."

Q You want to keep going?

A "Increase filter length. Increase filter efficiency." And one thing we will experiment with and looks pretty good is putting ventilation at the tobacco end of the filter as far away from the smoker as you can get them, maybe even in the tobacco.

Q Let me ask you first about increasing filter efficiency. It's pretty obvious that the companies can make filters as efficient as they want them to be, can't they?

A Yes.

Q The trouble is consumers don't like them.

A We are talking about technology being available to make it safer. And I've had this discussion. If, in fact, they knew it was safer, they might like it. If they knew the risk of contracting smoking-related disease was less, their attitudes might change.

As we go on, I have a specific way of doing that without violating any laws or FTC mandates or anything.

In the next page, I indicate that "The new designs, Accord, Premier, Eclipse, may be safer." I

0249

don't know for sure. They may be. Preliminary evidence looks good.

I call them addicts because they are. This was the American Society of Addiction Medicine's meaning of the term. You need to make sure they provide a sufficient level of nicotine to people that are dependent on nicotine at the same time as being safer. I'm not sure they do.

Q How much nicotine do the products need to provide?

A About two-tenths of a milligram per cigarette, plus or minus a tenth depending on the person.

Q What studies do you rely on?

A I think that has been quoted. Philip Morris had some studies. I think that may even be

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Courtesy of http://industrydocuments.ucsf.edu/docs/jjxd0001

from the FDA. I think that number is fairly well mentioned in several of the standard references.

Q If I understand your testimony, it is because the companies need to make sure their products do yield somewhere between .1 and .2 milligrams of nicotine per cigarette?

A If they want them to use that in place of a Winston or Marlboro, you have to make sure it yields the nicotine level of a Winston or Marlboro.

0250

Otherwise, there will be a certain bunch of people that say it doesn't do it for me. You have to have a high yield cigarette to convert them.

Q If the yield is too low, smokers won't smoke it?

A Yes.

Q And a cigarette that smokers won't smoke doesn't help anybody?

A That's the point of a lot of this.

Q Okay.

A I was really taken by my former employer's denicotinized cigarette. This goes back to something that Reynolds could do, but I'm just using Philip Morris. They sold it. Based on the evidence I've seen from documents within the company, that virtually eliminated both the TSNAs and VNAs as part of the nicotine removal process.

All you have to do is put the nicotine back, and you have a much safer cigarette. The real boost in disease caused by TSNA in low tar cigarettes probably wouldn't have happened, and I think that accounts for maybe 30 to 40 percent of disease with TSNA. We are talking about specific types of lung cancer.

Q What studies are you referring to?

0251

A Hoffman's work and other people's. The 1994, '95, '96 papers by Hoffman.

Q You think there is a consensus in the medical and scientific communities that TSNAs are responsible for 40 percent of lung cancer produced by cigarettes?

A I think what their needs to be is a consensus for Reynolds to make that decision.

Q Can you answer my question first?

A I think there is. I would think there is. There is a consensus among the people I talked to. If you eliminate TSNAs, the number would go down. Some are going to say 20. Some are going to say 40. It's a big number.

Q To tie this to something we were talking about earlier, obviously, you do think that this program at Reynolds to assist farmers in altering the manner in which tobacco is being cured is a very good thing, don't you?

MS. CHABER: Asked and answered.

THE WITNESS: Yes.

BY MR. FURR:

Q I missed something. When you were talking about the first point on this page where you say testing is needed after you were talking about

0252

Accord, Premier, and Eclipse, what kind of testing?

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Digitized by the Legacy Industry Documents Library - http://industrydocuments.ucsf.edu/docs/jjxd0001

A Biological, not just the three I picked. You pick some of the tests you got in whole big world of tests. You picked some of the tests and reported the results of some of those biological tests. It kind of like gives you a taste of the water without letting you know whether it's really good to drink or not.

So there is a battery of tests that we know about that Reynolds has used and Philip Morris has used in the past, both in vitro and in vivo tests.

Those new products should be tested and compared to low tar cigarettes to make sure we don't make the same mistake we made before of selling something which is supposed to reduce the biological activity but instead doesn't really do that. It needs to be tested at least in those in vivo and in vitro tests.

Q Is that it?

A No. One of the criticisms -- and one of the other attorneys in the room badgered me in the state of Washington case.

MR. LOMBARDI: I'll take that as a compliment, Doctor.

0253

THE WITNESS: Basically, the point I was trying to make in that case, which I'm not sure whether I did or not, is you don't need to advertise that you have safer cigarettes if you provide the results of the test that I'm talking about in this document.

And if it was done by independent people, peer reviewed or whatever, the data will speak for itself. You will sell that product because people aren't idiots. If something has a potential of allowing them to smoke and reducing disease, they will smoke. You don't have to have a billboard that says "Camel is the safest."

And then my last point is --

Q Let me ask you a question about that. I agree with you that consumers are not idiots. I would like to know what basis you have for believing that providing the type of test results that you are describing would alter smoking behavior.

A I have a lot of evidence for that.

Q Tell me about it.

A Sure. How many nonfiltered cigarettes sold? I'm going to go through them. If we start off with a cigarette that is not filtered and we put a filter on a cigarette, what is the presumption? The presumption is because they have a filter on it

0254

that it's safer. So all of a sudden filter cigarettes take over the market.

Low tar cigarettes, do you think people smoke low tar cigarettes because they like low tar? People smoke low tar cigarettes because they hope, if not expect, that those are safer and cause less disease.

Q You think that is why Leslie Whiteley smoked them?

A I don't know what Leslie Whiteley smoked, but generally speaking, my relatives, my mother, my sister, they all migrated to low tar cigarettes

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Digitized by Arnold and Mabel Beckman Foundation http://www.industrydocuments.ucsf.edu/docs/jjxd0001

because they believed they were safer. I had to tell them there is no evidence to do that and get them to stop smoking by understanding that there is no evidence to that effect.

All I'm asking is if the evidence is available, that data would speak for itself, and those people would migrate to that brand.

Q I wanted to make sure I understand something you said. I think what I heard you say is that people don't smoke low tar cigarettes because they find the taste preferable to high tar cigarettes. Is that part of what you said?

A I didn't say it that way, but I think I

0255

can agree with that characterization.

Then the final thing is that we have done a lot of epidemiology in the country, and one of the things I'm working on now is epidemiology by brand. I think that is important.

And this could easily be done in studies where you have a population of people that is willing to fill out a thing periodically or their habits are monitored so that in addition to letting the data speak for itself over the next 10 years or 15 years, the epidemiology would tell us the things you were concerned about.

I think whether or not the tests we are using are the right ones, the epidemiology can be correlated with the test and modify the test to be in concert with the epidemiology.

Q Don't you think epidemiology by brand would be very difficult studies to conduct?

A I think it wouldn't be any more difficult than the Maxwell studies on brand switching, when they start, when they stop. I've gone on presentations ad nauseam on the most intimate detail of a smoker's life. I don't think their death or disease would be any more difficult to brand.

Q I thought I heard you earlier today talk

0256

about brand change over time.

A That's correct.

Q Don't you think that would make brand specific epidemiology studies difficult to interpret?

A Not any more difficult than the current thing they like in terms of flavors or what they don't like. When you have got switching and things of that sort, it's difficult, but it's not impossible. And the alternative is you don't do anything because it's too hard to do, and you just let 450,000 people die every year.

Q Were you through with your presentation?

A I'm through. Those are all the technologies I think Reynolds could use to improve its products that are currently available.

Q Would you identify for us every scientist at R.J. Reynolds with the responsibility for cigarette design that you have ever met?

A Probably could not do that.

Q Can you identify one?

A Well, I knew some of them at TCRC, and I personally knew and in my former life worked with

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Creative Commons http://industrydocuments.ucsf.edu/docs/jjxd0001

Karol Mysels. I think the last time I went to a conference with a Reynolds scientist might have been

0257

the end of '93. If I had the TCRC, which is in, I think, the boxes that I have, I could go back and maybe find some names. But I don't recall as I sit here.

Q Can you tell me what you know about the design alternatives of the Premier and Eclipse that Reynolds has considered in modifying its cigarette products over the past 15 years?

A I can do that only from two sources. One is internal documents I have seen as part of litigation, particularly, some of Mr. Townsend's. And the second is the patents, the things we were talking about.

If you make the connection that basically what people care about in a company in terms of technology they patent. Otherwise, why go to all the effort? If you make that connection, then you can follow the patents and look at some of the things that have been done.

Q Okay. Isn't it true that you really don't have any firsthand knowledge about cigarette design alternatives that Reynolds has considered or evaluated over the past 15 years, but that your knowledge is derived solely from the review of documents of others?

0258

A And of Reynolds.

Q That is documents of people other than yourself?

A Yes, that's true.

Q Okay. Earlier today in response to a question you said that you had gone to extra lengths to be involved in Neri. What did you mean by that?

A That's my hometown.

Q Well, so all you were referring to is that you are willing to travel to New York to participate in the Neri case?

A I have a very difficult schedule, and that office gave me the opportunity to go home and visit people. The reason I do this is a public service. If I can be of service to my local community where I grew up, I am willing to go to extra lengths to do that.

Q Have you ever worked with any scientists at Reynolds on cigarette design issues?

A No, I have not.

Q Have you ever heard of a program that Reynolds called the product stewardship program?

A Only through documents. I can't say I was familiar with it in detail.

Q What do you know about the product

0259

stewardship program at Reynolds?

A Let's see if I can categorize it. It's sort of a quality program, a product quality program.

Q Do you understand it's really a protocol of evaluations that are conducted anytime a change is proposed to any brand of cigarettes that Reynolds either designed or manufactured?

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Generated by unknown on industrydocuments.ucsf.edu/docs/jjxd0001

A That's what I meant by quality, to maintain the quality of the product.
Q Are you in favor of such a program?
A Depends. Programs like that, I do know at Philip Morris, were used to prevent changes that could have made the product safer.
Q You are not suggesting you have evidence that the Reynolds product stewardship programs are used to impede making the cigarette safer?
A Yes, I do.
Q What evidence?
A We don't have them, safer cigarettes.
Q And from that you draw the inference that Reynolds product stewardship program is used to impede the development of safer cigarettes?
A It doesn't help. I mean, it certainly didn't help it. If it had helped it, Reynolds would

0260

have safer products.
Q Tell me what you know about the philosophy of the Reynolds product stewardship program, the scientists involved, and the types of protocols and tests they perform on cigarette design modifications.
A All I can recall is that this is a program to make sure that the quality is maintained, that it has a similar amount of smoker satisfaction. You don't have people getting turned off of the product because it's not as good as the previous product.
Q Do you know of a program designed to ensure that no change made to any product will increase the toxicity of the product?
A No, I don't know that for sure, but it sounds good and logical.
Q Do you know what scientists at Reynolds are involved in the stewardship program?
A No, I don't.
Q Do you have any understanding of the protocol for the testing of additives at the R.J. Reynolds Tobacco Company?
A I think I have some. We've gone around and around on this. The data is not published.
Q Tell me what you know about what types of

0261

tests are conducted on additives at Reynolds.
A I'm not sure they do any.
Q You don't know, in other words?
A That's right. Other than what I said, there is no evidence from documentation that I have seen as presented in these cases that extensive toxicity tests of the kind I think are pertinent have been done on additives at Reynolds or at Philip Morris.
Q Have you conducted any search on the Minnesota website related to Reynolds?
A Yes.
Q What types of searches have you done?
A I spend some entire evenings reading documents on the websites because you don't have to download them and copy them. You just go real fast.
Q My question is what types of searches have you done on Reynolds documents?
A I tried to find historical data to draw

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Courtesy of http://industrydocuments.ucsf.edu/docs/jjxd0001

the parallels between Reynolds and Philip Morris and other companies with regard to what kinds of technology they were implementing at different times, you know, following the work, for example, on the retroengineering of Marlboro, on the tobacco modification programs that we were talking about,

0262

the expansion programs.

So I've tried to learn as much as I could about their documents in comparison with other companies.

Q Why have you done that?

A I want to see if there is any difference in what the different companies were doing, either in terms of their testing or in terms of the technology in general, that is available to them.

That is important in the progress of the entire industry, and so it's important to make that kind of comparison to see if certain companies have less capabilities, less research budgets, and so on than others and what do they know and how are they approaching the problem.

Q Are you involved in cigarette design issues today other than through your involvement in the litigation?

A I have offered to be involved, but so far I've only talked with a couple companies. They were mildly interested. I have not been retained by anybody to be involved in any such program yet, but I talked to a couple small companies I have been contacted by if I would help them. "Well, be more specific."

0263

They ask me some questions along the lines of what we are talking about today about cigarette design. I tried to help them, but I don't have any contracts or there is no active program I have.

Q Okay. To restate the obvious, you think that creating a safer cigarette will be a very important thing to do, don't you?

A I do.

Q You think that if a safer cigarette could be created, it would be extremely important to publicize to a smoking public, either that the safer product had been provided or to provide data that demonstrates that safer products have been created, don't you?

A I think it's very fortunate that that concept not come from the industry. It has to have the credibility of a peer review or independent kind of thing.

And let's not try to say, "Oh, that's too difficult. The public health community will be in a public outcry." There is a number in the public health community that sees the benefit of a safer product.

I brought a paper about long-term nicotine dependents about providing products to allow people

0264

to continue to be dependent on nicotine for people that just can't quit. I think we are finding a difference in philosophy. I think it would work. I really do. I see no reason why it wouldn't.

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Digitized by the Legacy Industry Documents Library http://industrydocuments.ucsf.edu/docs/jjxd0001

Q What is the safest cigarette on the market today with respect to lung cancer risk?
A Don't know.
Q Are other cigarettes on the market safer than others?
A Part of the problem is there is no data that I have that proves that.
Q Is there any cigarette product that Leslie Whiteley could have changed to when she came to Camel Lights in the early eighties that would have helped her?
A If that information was available, that would be great. As far as I know, it wasn't available and isn't available now.
Q Are you familiar with a study published by Jed Rose regarding kinetics in the uptake of nicotine into arterial blood?
A That does not ring a bell.
Q From a purely design perspective, just from design, why is Marlboro the best selling cigarette in the world?

0265

MS. CHABER: Can I have the question back?
(Record read)
THE WITNESS: I have concluded, as Reynolds did, that it has to do with the way that particular product delivers its impact and satisfaction, its nicotine. It's a combination of the tobacco that is used, the additives that are used, and the construction of the cigarette.
And attempts to mimic that have fallen short in a couple of important ways. First of all, I'm not aware of any other company that has a band cast process.
Q What does that do?
A It's a different way of making reconstituted tobacco. At least while I was there and into the future after that, there was a very, very great concern about eliminating it until they figured out exactly how to do it.
For a long time, besides the ammonia, the licorice, the chocolate, the St. John's Wort, and a few other things thrown in there, there was, I believe, based on evidence, whenever they ran tests and removed all of the BL, they would have a product that wasn't quite as acceptable to consumers. So they tended to use that more in the Marlboro.

0266

Now, at the time I was leaving -- I haven't picked one apart recently to see what is being used -- but they were trying to modify the reconstituted leaf to be the statement as the BL in terms of its acceptability.
That is one of the things I threw in this thing we talked about a little bit earlier, to decrease additives and sizing on reconstituted tobacco, which were eliminated. It wasn't as good as what everybody else is doing.
So to the extent you make RL more like BL, then my concern is it also becomes more toxic. So I think it's a combination of those things, and probably that has prevented people from copying it exactly.

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Courtesy of the Legacy Tobacco Documents Library (LTDL) http://industrydocuments.ucsf.edu/docs/jjxd0001

Q I take it that one of the factors is people like the taste of Marlboro?
A Well, okay.
Q Is that correct?
A Well, I don't know what taste in a cigarettes identifies. Your lungs don't have taste buds.
Q Your mouth does, though, right?
A Correct. So if you don't inhale, taste is more important. I made a comment that when I used

0267

to be on tasting panels, I don't inhale, but I was very, very good at discriminating tastes between products.

The people that inhaled, they would be less discriminating about taste. They would still be discriminating about their brand. Each brand has a slightly different profile. It's how quickly you get the impact or the satisfaction or nicotine to your blood or whatever you want to call it.

So you have to look at that delivery package. A cigarette gets nicotine in quicker for whatever reason. I have a paper in here of all the different parameters that are important. You have to copy it exactly.

When Reynolds put the ammonia in the products, there was an increase for a while in Winston sales. That was the reason for the concern. So that is part of it.

Q How does Marlboro deliver its nicotine yield quicker than other cigarettes?
A I don't know the answer to that.
Q One of the points you made -- the very first point you made in response to my question about why Marlboro is the best selling is that it delivers nicotine differently than other cigarettes.

0268

A That was a hypothesis. I don't have any evidence against it or for it. I don't recall or don't know whether it's either by blood level studies or by EEG. I don't have available to me evidence which would prove that hypothesis.

You asked me why. I'm giving you the basis, as I understand it, of cigarette design. So I was trying to answer the question as completely as I could.

Q All I'm doing is trying to figure out whether you are simply reasoning or speculating or whether you have support for what you are saying.
A I gave you the support. It's not speculation. It's based on the information I have.
Q Is the market share the cigarette brand achieves correlated with its pH level in any meaningful way?
A You know, I don't think the entire industry can measure pH.
Q Okay. Does that mean you don't know whether it's correlated or not?
A I'm just saying the correlation, if you can't measure it, how can you correlate it.
Q So you believe the existing data is inadequate to evaluate that question?

0269

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Digitized by the Legacy Industry Documents Library - http://industrydocuments.ucsf.edu/docs/jjxd0001

A I believe the existing data are a jumble of numbers that are either deliberately or through whatever means been made so meaningless that it is very difficult to use pH for anything. You can find, you know, the differences of whole pH units that have factors of 10 like the difference between an earthquake at six and seven on the Richter scale.

I can show you studies where the same cigarettes measured by two people who claim to be relying on the same results are different by a whole pH, not a tenth or two-tenths, but a whole pH unit. Now, someone is wrong, somebody is cheating, or the whole thing doesn't mean anything.

Q Have you ever done pH testing on cigarette products?

A Yes. There are lots of different ways to do it.

Q Using the way you think is the most valid, are the market shares cigarette products attain correlated with their pH?

A No, I can't say that. What I can say is that over the last 20 years, the pH of cigarette products have increased by about a full pH unit on average by any testing methodology that you want to

0270

accept. Probably Philip Morris.

Q How has the pH of Camel Light changed over the past 20 years?

A I don't have a specific one. I have several points along the curve. In a recent deposition -- maybe it was the Neri deposition -- the attorney happened to bring along Jerry Morey information from the late sixties, early seventies, which said the average cigarette pH was around 5.2 or something. Currently people are reporting 6.2.

Q My question was specific to Camel Lights.

A I don't have numbers for Camel Lights.

Q Have you ever conducted any test on pH on a Camel Light?

A Not personally. We did them at Philip Morris, but I don't recall the pH.

Q Have you ever conducted any experiments on Camel Light cigarettes?

A Yes. Personally, yes.

Q What type of work have you done on Camel Lights?

A I have this habit of taking people's cigarette and tearing them apart and trying to identify the different parts of tobacco. It's a skill we learned back at Philip Morris.

0271

If you take three or four of them and have a microscope or magnifying glass, you can tell the difference between Burley, Bright, Oriental. You can be a little bit wrong, but it gives you a rough idea as to what the blend is.

Q How has the blend of Camel Light changed over the past 20 years?

A I don't recall.

Q How have the additives in the past 20 years changed in Camel Lights?

A I don't know specifically.

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Digitized by the Legacy Industry Documents Library - http://industrydocuments.ucsf.edu/docs/jjxd0001

Q How has the level of nicotine in the smoke of the Camel Light changed in the past 20 years?
A I don't know.
Q Let me go back to this TLV issue. You are familiar with an OSHA PEL and how it relates to a TLV?
A There are different levels. There is a special eliminating value. There is a short-term exposure limit. There is a primary exposure level. I think that is the PEL. There is immediate danger to your health level. There are different kinds of levels they talk about.
The TLV numbers normally are described not just in OSHA literature, but like in business and

0272

health reports that publish different kinds of things. You can buy an environmental kind of handbook, and they give you all the different numbers.
Okay. It can have even U.S. government, state government, Cal OSHA, whether it's immediately dangerous to your health, PEL, or short-term exposure limit. So you can look at all the numbers.
Q Maybe I just didn't hear you. How do TLVs relate to PELs?
A They can sometimes be the same. Some of them are preliminary and sometimes refer to them as PELs. And some of them refer to them as TLVs.
Q Assuming that PELs and TLVs are the same and embody the same concept, I'm confused by your comparison of cigarette yield to a TLV or PEL. I thought that PELs were eight-hour time-weighted averages; is that not correct?
MS. CHABER: First, I would object. Lack of foundation. Assumes facts not in evidence in terms of them being the same.
BY MR. FURR:
Q Isn't that your understanding of what a PEL or TLV is?

0273

A Yes.
Q You are taking the cigarette for a particular constituent and translating that into a concentration in terms of micrograms per cubic meter; is that correct?
A Or milligrams.
Q You are then comparing that to a PEL?
A That's correct.
Q But PELs are eight-hour time-weighted averages, aren't they?
A Yes. But we also have to remember, as I made this point very clear, the exposure limit that is safe from an ambient air quality point of view is a thousand times less than the TLV.
If you add up the number or the exposure over what duration, how many cigarettes they smoke over eight hours, you are going to find the exposure is still very, very great. It depends on what kind of smoker we are talking about.
If you want to use immediately dangerous results to your health level, we can do that, too. It doesn't change it by very, very much. They are

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Digitized by the Legacy Industry Documents Library - http://industrydocuments.ucsf.edu/docs/jjxd0001

only different by a factor of five or 10. The point is that all of the safety stuff starts from that exposure, that time-weighted average.

Again, we had this discussion before. You are equating the smoker's exposure to the mainstream that is delivered. You are pretending a smoker doesn't sit in the room after he smokes it or he only smokes it outside, so there is no additional exposure due to sitting in the sidestream smoke.

Q I'm not pretending anything. All I'm doing is asking you a question.

Here is what I wanted to ask you: I understand your comparison of the yield of a cigarette to a TLV as though a TLV were a single point measurement.

A Correct.

Q But if you treat TLVs for what they really stand for as being eight-hour time-weighted averages, the comparison you have been making suggesting that cigarettes yield constituents at levels higher than PELs doesn't hold, does it?

A It does. I tried to go through that. Okay. Take the TLV. Over what time does the exposure occur for the smoking?

Q Well, since our Plaintiff in this case smoked one pack --

MS. CHABER: Lacks foundation.

THE WITNESS: The question is, how long does it take to smoke a cigarette? Over what time does the exposure occur?

BY MR. FURR:

Q How long does it take to smoke a cigarette?

A Depends on the smoker and how far over the PEL or TLV was the value. If you do the calculation, they are 10 or 100 times over. If you use IDHL numbers, for example, the instantaneous level of nicotine delivered by any cigarette is far above the IDHL level for nicotine.

If I dropped a beaker of nicotine in this room, I would have tremendous liability for exposing you to nicotine just based on a vapor content in the room. That is less than what a smoker gets.

And the TLV represents the most common set of numbers which you can compare those things. If you want, we can get into the minutia of how they relate. I'm willing to do that.

Q At trial we will use an example to do that. We will work through an example together. Let me ask you about this testimony you gave today about you believing that under the federal OSHA act you would be in violation of that act to allow your employees to smoke in your office.

A That's correct.

Q Is it true, Doctor, that the federal OSHA has been evaluating for about a decade now whether or not to implement or place smoking restrictions?

A You mean the regulators?

Q The federal OSHA.

A Well, it's not the act. Yes, that is the

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Digitized by the Legacy Industry Documents Library - http://industrydocuments.ucsf.edu/docs/jjxd0001

agency. I'm talking about the law.
Q The agency that administers the law.
A I'm talking about the law itself.
Q Your interpretation of the law is what you are taking about?
A The interpretation of the law, which I'm required under the law to make, it's not me arbitrarily saying I'm going to interpret this law. I can be held liable for not interpreting the law.
Q Can you answer the question I asked you, please? The question I asked you is, isn't it true the federal OSHA has been evaluating for about a decade --
A The agency, yes.
Q -- whether or not to implement workplace smoking restrictions?
A Yes.
Q And they issued an RFI, or request for

0277

information, during the nineties?
A Yes.
Q They developed the largest administrative record in the history of the United States for any federal agency; isn't that correct?
A I'm not sure that I know that.
Q Isn't it correct they held six months of public hearings on this issue?
A I remember the hearings. I don't know if it's six months.
Q I was there for six months, so I will represent that to you.
Isn't it correct that today the federal OSHA still has not determined it should issue a regulation imposing workplace smoking restrictions?
A From the agency's point of view, that is correct.
Q Okay. Have you ever heard of an instance in which OSHA has cited an employer for a safety violation for permitting smoking in the workplace?
A Federal?
Q Yes.
A No.
Q Have you ever spent any time in the R.J. Reynolds research and development department?

0278

A Not in the whole department. I think I went on a tour of the facility. That's all.
Q Tell me what you know about how many Ph.D. level scientists Reynolds employs in its research and development department and what types of disciplines they are.
A I don't have that information. I could look it up, but I don't have it at this time.
Q What do you know about the research and development budget at R.J. Reynolds?
A I don't have an exact number.
Q You probably have read some of the articles written by Reynolds scientists and published in the peer review literature, haven't you?
A Yes.
Q Do you have an understanding as to how many of those articles have been published by

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Digitized by the Legacy Industry Documents Library - http://industrydocuments.ucsf.edu/docs/jjxd0001

Reynolds R&D over the past decade?
A I haven't done a literature search in the past decade. Earlier on we used to keep track of all of the publications of all of the scientists from all of the companies. When I was at Philip Morris, that was a big deal for comparison numbers. We published 53. You only published 40. I don't

0279

keep up with it on an annual basis.
Q I asked about over the past decade. Would you agree Reynolds research and development department has published hundreds of peer review publications over the past decade?
A I can agree with that.
Q When we walk through your presentation where you outlined your views on how cigarette design should be altered to make a safer cigarette, I want to know whether you have any firsthand knowledge regarding why any of the features that you have outlined in your presentation have not been implemented at R.J. Reynolds?
A Yeah. Firsthand, I think that is the key to the whole thing. What do you mean by "firsthand"? Was I personally there and saw it? Then I don't have it.
Q You were there, saw it, someone who was there and saw it told you?
A Then there is plenty of evidence to that effect in the documents that have been given over as a result of these various litigations.
Q Your opinions are based on review of the documents. Do you know whether Leslie Whiteley would have changed her brand of cigarettes she

0280

smoked if she had been provided with the type of information that you have outlined here for us today that you believe should be developed and provided to smokers?
MR. BROWN: Objection. Exceeds the scope of this expert's designation.
THE WITNESS: I think I mentioned I don't have any information on Leslie Whiteley.
BY MR. FURR:
Q Tell me something, Dr. Farone, what is a cigarette?
A Now, there is a very deep, legal, and technical question.
Q I should probably get a very thorough answer then.
A I don't think there is a generally accepted definition of cigarettes. Unlike most other consumer products, there is no standard of identity like there is for margarine or cheese.
Q Let me interrupt you. As a matter of fact, cigarettes are statutory defined?
A Class A cigarettes are statutory defined. There is a definition of the Bureau of Alcohol, Tobacco and Firearms of a Class A cigarette. It doesn't say, for example, it must contain 90 percent

0281

tobacco or 50 percent tobacco or 10 percent tobacco.
It isn't what formally in the product community you think of as a standard of identity

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Digitized by the Legacy Tobacco Documents Library http://industrydocuments.ucsf.edu/docs/jjxd0001

that puts limitations on what you can put in and what it must contain. It's a different kind of definition.

Q What is the definition?

A It's a tobacco product. It's very short. If I remember correctly, it's very short.

Q Tobacco rolled in paper?

A It's something like that. Something like that as distinct from a cigar.

Q As I understand it, you have proposed what you believe is the motto that there should be a safer cigarette product?

A That's correct.

Q And as I understand it, it's basically a plastic straw coated in the inside with the flavor of nicotine; is that correct?

A That's similar to the idea.

Q That is not a cigarette, sir, is it?

A Well, yes, it could be a cigarette.

Q It's not a cigarette as cigarettes are defined by the federal government, is it, sir?

A As it's currently defined right now,

0282

that's correct.

Q Okay.

A But neither is an Accord or Eclipse.

Q Wait a minute. Eclipse is not a cigarette?

A It's tobacco rolled in paper. Nothing else in it. It's tobacco rolled in paper. It doesn't say anything about putting any flavor in there whatsoever. So you can argue if you add something other than tobacco, it's no longer a cigarette. I think the definition you gave me, if it's correct, doesn't say anything about any additive.

Q Is a Marlboro a cigarette?

A I guess not.

Q There are no cigarettes in the United States, I take it.

A What has happened is that the industry has decided to sell whatever they want to sell and call it a cigarette.

Q So really my question to you is, are there any cigarettes manufactured and sold in the United States?

A I say yes. You gave me definition which implies no.

0283

Q All the products manufactured and sold in the United States don't meet the statutory definition of a cigarette?

MR. BROWN: They don't meet what you told us was the definition.

MR. FURR: I'll represent it's the same, and I think you know it is.

MR. BROWN: Do we really need to miss our airplanes to debate what a cigarette is?

Can you read the question back?

(Record read)

THE WITNESS: It appears to be the case.

MR. BROWN: Assuming an accurate definition has been provided, of course.

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Digitized by the Legacy Industry Documents Library - http://industrydocuments.ucsf.edu/docs/jjxd0001

MR. FURR: Okay. That's all I have.
MR. LOMBARDI: A few more.

FURTHER EXAMINATION

BY MR. LOMBARDI:

Q You answered some questions about pH put to you by Mr. Furr.
Do you recall that?

A Yes.

Q And you made some comment about pH numbers that you have seen over the last 20 years or so not being consistent or something along those lines.
Do you recall?

A Yes.

Q What was your testimony?

A It was about the Coresta conference, and Philip Morris had some cigarettes made and tested by Labstat. And as part of that, in my stack I brought you Philip Morris's definition of those cigarettes that were made for that study.
When Philip Morris determined the pH of those cigarettes, they determined the pH was 5.2 to 5.3 of the test models used in the study. That study has been held out as being an authoritative study on deliveries and so on.
Dr. Rickerts' pH numbers are between 6.2 and 6.3. It's a full pH difference. He goes into great explanation on how he does it. My conclusion from that is that one or the other doesn't know how to measure pH or they are using techniques that are so different or there is some other problem in pH measurement because that difference is similar to differences that you see across 20 years.

Q You referred to Philip Morris and the Coresta presentation; is that right?

A That's right.

Q Was that from this year?

A Yes.

Q Were you at that presentation?

A No, I wasn't.

Q Has there been a publication out of that presentation, to your knowledge?

A I don't know of any yet. I just saw the slide presentation, and I brought a copy of it which is in the stack.

Q So you have seen the slides that were shown by the Philip Morris presenters to Coresta?

A That's correct.

Q And as best you can tell from those slides, did Philip Morris do pH studies of cigarettes?

A It wasn't on the slides.

Q How did you come to the conclusion that Philip Morris had done pH studies?

A Because as part of information I was provided along with the Rickert report, which is the original data for the slides, I was also presented with a document that was done by Elizabeth Chambers at Philip Morris who does that kind of reporting of all the parameters for the cigarettes. In that Philip Morris document, the pH is measured as it is

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Courtesy of http://industrydocuments.ucsf.edu/docs/jjxd0001

0286
in the Rickert study.
Q How did you determine that Elizabeth Chambers' report was related to the pH studies done in the Rickert report?
A As I understand it, it was part of the information provided by Philip Morris concerning that report and those documents.
Q How did you come to that understanding?
A From the documents that were transmitted to me.
Q Who transmitted the documents to you?
A I'm not sure.
Q You have not talked to Philip Morris scientists about this work?
A That is correct.
Q You have not talked to anyone at Philip Morris about the Coresta work?
A Not directly.
Q Indirectly?
A Indirectly I talked to John Slade.
Q Who is that?
A John Slade is a person who is interested in smoking and health on behalf of the state of New Jersey, as I understand it.
Q Is he a government employee?
0287
A I'm not sure.
Q Does he live in New Jersey?
A Yes.
Q Did he attend the Coresta presentation?
A He gave the paper at the American Society of Addictive Medicine, and that is where I met him. And we discussed the Coresta presentation because he was interested in it.
Q And neither one of you had been to the Coresta presentation?
A I don't know whether he had or not.
Q Do you have any knowledge of whether he was actually at the Coresta presentation?
A No, I don't.
Q Okay. So the two of you, possibly neither of whom had been to the Coresta presentation, discussed that presentation; is that correct?
A Yeah. He sent me a copy of it.
Q And is it your testimony under oath that you understand what was done with respect to preparation of cigarettes for the Coresta presentation that you did not attend?
MR. BROWN: Objection. Argumentative.
THE WITNESS: It's my testimony that when scientists send out something, it is supposed to be
0288
representative of what they talked about. Just with my slides that are in this document, that information required to interpret that is with it.
So I made the assumption that Philip Morris people were doing what they were supposed to do scientifically. If they withheld some piece of information purposely to mislead me, I wouldn't know about that.
Q Sir, do you have the Elizabeth Chambers paper with you?

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Digitized by the Legacy Tobacco Documents Library http://industrydocuments.ucsf.edu/docs/jjxd0001

A I do.
Q Okay. This document that you just pulled out has a marking on it. Do you see it's been marked as Exhibit 4 from the Ellis deposition?
Do you see that?
A Yes.
Q And that is the Elizabeth Chambers work you are referring to?
A Yes.
Q And that work was done -- or at least the memo is dated June 17th of 1998?
A That's correct.
Q It has pH measurements on it?
A It has pH measurements for all the experimental cigarettes.

0289

Q Are those experimental cigarettes in the sense of reference cigarettes or some other type of cigarette?
A Some of them are commercial. The first one is commercial Marlboro Lights King Size and for a 1998 type of tobacco blend. Then there is Marlboro Lights King Size with 24 percent RLTC, which is a type of RL.
There is Marlboro Lights KS purportedly with no ingredients added, and Marlboro Lights KS with 24 percent RL, no ingredients added.
Q Is it your testimony that this information in the Elizabeth Chambers memo was used to develop the data for the Coresta proceeding?
A It's my understanding these same products with these same designations were used in the tables that are in that document.
Q And your basis for that is the slides from the Coresta presentation?
A And the Labstat presentation. And I think this has come up before, I think, in one other case concerning that Labstat report, in other words, what products were they, in fact talking about. This, in fact, was the explanation of what product they were talking about in that report.

0290

Q Okay. Sir, would you agree with me there are various methods of using pH of smoke; is that correct?
A Yes.
Q And those methodologies will result in different pH's of the same smoke; is that correct?
A That is correct.
Q One methodology might come up with a lower pH and another methodology might come up with a higher pH of the same smoke; is that correct?
A That is correct.
Q Do you know what methodology Elizabeth Chambers used to determine the pH of smoke in the memo that's been identified as Ellis Exhibit 4?
A No, I don't know what was done in June 1998. I only know what was done at the time I was there, and I know what was talked about in the Coresta -- I mean in the Labstat report because he is very careful to tell what measurements.
Q But just so the record is clear, you don't know what method was used by Elizabeth Chambers to

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Digitized by the Legacy Tobacco Documents Library http://industrydocuments.ucsf.edu/docs/jjxd0001

derive the data in the June 17th, 1998 material?
A That is correct.
Q Do you know what method was used for Labstat?

A I do.
Q And is that a method that you acknowledge as an accurate measure of smoke pH?
A I think I testified about half an hour ago that I don't think there is an accurate measure of smoke pH. One of the problems is that all of this debate is that you can generate numbers for the same products, and you can make it lower or make it look high.
So if we take the facts in evidence, let's assume these are the same products and Philip Morris does it and gets 5.3 and somebody else gets 6.2, 6.3, then clearly there is a methodology for measurement that can give you a huge variation.
That makes you wonder about all the rest of the numbers and all the rest of the data. That is one of the problems of scientists. You can make things be very confusing if you don't specify exactly what methods are being used and how it's being done.
Q Sir, if there is confusion in pH numbers based on the methodologies used, what is the basis for your conclusion pH has risen by a magnitude of tenfold over the past 20 years?
A If you accept the Jerry Morey article of

saying that it was 5.2 and he is using a methodology or an average similar to what Labstat has talked about because those are published papers and the method that was used earlier is similar to that, you have to compare similar numbers over time and done in the same lab by the same method.
One of the problems in this whole pH thing is that having had people call me up and say, you know that they called somebody at some cigarette company and they gave us a number of 4.5 and another person says it's 6.2, what I'm saying is that we should not depend on these PH numbers to prove that it stayed the same if the numbers are all over the map.
Q And similarly, we can't depend on pH numbers to prove the pH has changed?
A I think that the problem is --
Q Can you answer that question?
A I disagree with that.
Q You can't rely on pH numbers to say that pH has not changed or you can rely on pH numbers to say that pH has changed?
A You can rely on a pH number where the person publishing the pH number tells you exactly how they did it. You cannot rely on a pH number

generated by anybody, including the industry, that they don't tell you how they did it. You don't know what pH we are talking about and the methodology.
As a part of my thesis for how one goes about designing cigarettes and getting agreement on what is safe and not safe, you have to have

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Downloaded from industrydocuments.ucsf.edu/docs/jjxd0001

protocols and methods that people agree with. So I disregard that portion of the documentation dealing with pH on behalf of Philip Morris because they didn't tell me how they did it.

Q You are talking about the part of the Coresta document related to pH?

A Yes.

Q You are looking at the Morey article as an early 1970s measure of pH and the Labstat measure as a more current measure of pH?

A And the Morey article was derived from literature values. That is values that were published at the time when we do the pH measurement. If we are going to talk about changes in pH, what we have to do is make sure we are talking about apples and apples methodology being the same across the years.

Q Is the Morey article the early indication of pH that you rely on for your opinion pH has gone

0294

up by a magnitude of 10 in the last 20 years?

A It's a document that makes that statement. There is no measurements in that article, but he draws that from literature. It refers to the literature. What we have to do is to go back and get the TCRC documents that talk about pH and go ahead and do that assessment.

Q You have to go back and find the documents he relied on in deriving pH to determine the methodology that was used?

A True.

Q And you have to determine if that was the same methodology used by Labstat?

A Yes.

Q Only after doing that can you make the determination if pH has risen over time?

A That's correct.

Q And you have not gone back and checked the references for what the methodology was for pH measurements?

A No. I just know the values when I was at Philip Morris which occurred slightly thereafter agreed with what Morey put in there.

Q Again, you don't know what Morey's methodology was, do you?

0295

A I'm talking about the published pH's that we knew what the methodology was. Those numbers were about 5.2, 5.3, as described by Morey.

Q Just to make sure, your testimony is that Morey indicated that pH of tobacco smoke was 5.2?

A The average of brands on the market.

Q It was 5.2?

A Right, something like that.

Q He said nothing about a pH that went into the six range; is that correct?

A That's correct.

Q And you are certain of that?

A I don't have the article here.

Q I just want to make sure whether you are certain or not.

MR. BROWN: He just answered the question. You don't have to answer it twice. He just answered it.

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Digitized by the Legacy Industry Documents Library - http://industrydocuments.ucsf.edu/docs/jjxd0001

He said, "I don't have the article here." And you come right back and ask the same question. Asked and answered and misstating what he has been saying.
BY MR. LOMBARDI:
Q Can you answer the question?
A I can answer it again.
MR. BROWN: He already did.
THE WITNESS: I can recall from that article

0296

that it was 5.2 or 5.3. I don't recall a number over six. It doesn't mean it wasn't there.
BY MR. LOMBARDI:
Q But a magnitude of one level of pH when you go from a five to six in pH, that is a significant magnitude; is that right?
A Absolutely.
Q Sir, you testified something about the epidemiology of low tar cigarettes when Mr. Furr was asking you questions.
A Yes.
Q And you said that there were some studies that said there was no reduction in risk of disease as a result of epidemiology -- strike the question.
I believe you testified that there were studies that indicated there was no reduction in lung cancer as a result of use of low tar cigarettes.
Do I have your testimony right?
A Or risk.
Q What studies are you referring to?
A Epidemiology. The death rates due to smoking.
Q Are you talking an aggregate death rate related to smoking generally?

0297

A Okay. There is a certain number of death rates associated with smoking. If, in fact, the low tar cigarettes resulted in the decrease in that, then, in fact, the death rate would go down. It didn't go down.
Q Are you aware of any studies that have specifically isolated low tar cigarettes and done a study of the epidemiology to determine whether the low tar cigarettes caused any reduction in risk?
A I'm going to rely on Philip Morris. They indicated low tar cigarettes are no safer. They stated that.
Q I don't want you to rely on Philip Morris. You are the expert here.
MR. BROWN: You can't tell him what to rely on.
BY MR. LOMBARDI:
Q Put Philip Morris aside. However you would like to frame it, put Philip Morris aside.
Apart from what Philip Morris said, are you aware of any epidemiological studies that have concluded that there is no reduction in risk as a result of the use of low tar cigarettes?
A Yes.
Q Which ones?
A The reported death rates per capita that

0298

have been published.
Q My question is slightly different. I want

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Courtesy of the Legacy Tobacco Documents Library (LTDL) http://industrydocuments.ucsf.edu/docs/jjxd0001

to know if there is an epidemiological study that isolated out low tar cigarettes and their effect on the risk of getting disease that has indicated that there is no reduction in risk?

A Let's understand that you can't tell me how to do my science. Okay.

Q I want to know what you know. Are you aware of any such study?

A Let me explain.

Q Please.

A Low tar brands became very popular. I think, as a matter of fact, the Marlboro sales are no longer in the Regular brand. The predominant number of smokers is in the Lights.

The number of deaths per capita per smoker has not decreased. If, in fact, low tar cigarettes result in a reduction in death or risk, there would be a concurrent reduction in death per capita per smoker as a result of the switch to low tar brands. It's very simple.

Q Are you referring to the CDC studies?

A It's data, if you want to call it that. I'm using the basic data. To me data represents the

0299

result of a study.

Q Now, putting that data aside for now since you told me about it, are there any other studies that support your conclusion?

A Let me put it this way: I don't think I need any other studies. That is the fundamental data. Any other study would have to come to the same conclusion unless they are going to contradict that data.

Q But my question is very simple, sir. Are you aware of any other studies?

A Not as I sit here today.

Q Sir, are you aware of any epidemiological studies to the contrary, namely, that show that low tar cigarettes do result in reduced risk of obtaining lung cancer?

A No.

Q You are aware of none; is that correct?

A I'm aware of some subsets of studies, I think, in Europe that tend to indicate that they think there might be some benefit. But other changes were made in those products at the same time, so we are not quite sure exactly what it means.

Q Apart from those studies, are you aware of

0300

no epidemiological studies that indicate there is a reduced risk for people who smoke low tar cigarettes; is that correct?

A That's correct.

Q Sir, are you aware of any governments that today recommend that if you choose to smoke you smoke a low tar cigarette?

A I believe there are some foreign governments.

Q Which governments?

A I think it's Germany. I don't remember exactly.

Q Have you surveyed which governments?

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Digitized by the Legacy Industry Documents Library - http://industrydocuments.ucsf.edu/docs/jjxd0001

A No.
Q Do you have any reason to doubt those governments analyze epidemiological evidence before making that recommendation to its citizens?
A Do I have any evidence they did or didn't?
Q Do you have any reason to doubt they consulted epidemiological studies prior to making a recommendation to its citizens that choose to smoke that they should smoke low tar cigarettes?
A I would like to have the information to review. I don't have it as I sit here.
Q What has the surgeon general of the United

0301

States said about low tar cigarettes?
A Which one?
Q Any surgeon general. Are you aware the surgeon general addressed the question?
A Yes.
Q What juncture?
A I believe that the last two reports make some mention of it.
Q Meaning --
A '94, '96.
Q Do you know who Jonathan Samit is?
A The name, yes.
Q Do you know who he is?
A I don't know personally.
Q Let me see if I can refresh your recollection. Do you know him to be an epidemiologist?
A Yeah.
Q Do you know him to be an epidemiologist associated with John Hopkins University?
A I don't know where he was from.
Q Do you know him to be an epidemiologist that published frequently in scientific literature?
A I have seen his name.
Q Do you know what conclusion Dr. Samit came

0302

to concerning the epidemiology of low tar cigarettes?
A No.
Q Have you seen anything published on that topic by him?
A No.
Q You don't recall how those publications came out?
A I didn't come here studied up on all my epidemiology.
Q Sir, I don't want to get you all into the entire nicotine analog story. I know you testified to that. I'm going to try to be narrow in my questions.
There was a nicotine analog program which sought to find a nicotine analog for use in cigarettes?
A That's correct.
Q Was the work that Dr. De Nobele did -- at least part of the work Dr. De Nobele did -- part of that nicotine analog program?
A Yes, it was.
Q Did the work done by Dr. De Nobele result in the discovery of a nicotine -- strike that.

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Digitized by the Legacy Industry Documents Library - http://industrydocuments.ucsf.edu/docs/jjxd0001

Was the work done by Dr. De Nobele
0303
successful in finding a nicotine analog that could be used in cigarettes?
A The work done by Dr. De Nobele was successful in identifying whichever of the nicotine analogs had properties in the rats that he studied most closely resembling nicotine. So you have to be very careful.
Q All right. Was further testing necessary after Dr. De Nobele finished his evaluation to determine whether these were nicotine analogs that could be used in cigarettes?
A My opinion is I have testified I think further testing is required before you put anything in a cigarette to make sure that it's not posing any greater risk.
Q I understand that you said there should be testing on toxicology and that whole battery of tests. I'm talking about specifically testing on the properties of the nicotine analog to determine whether it has the desired properties to use in place of nicotine.
Do you understand the distinction?
MR. BROWN: You are talking about the analog you were mentioning before?
BY MR. LOMBARDI:
0304
Q I don't recall you saying there was a specific analog.
A There was a few of them.
MR. BROWN: He said he found which analog most clearly resembled the nicotine analog used in rats.
Is that the one you are talking about?
THE WITNESS: As I understand it, there were some.
BY MR. LOMBARDI:
Q Let me state the question. As you understand it, did Dr. De Nobele find a nicotine that had the properties of nicotine?
A He found several that appear to be similar, and he found one -- I believe it was ethel pyridine. We can look it up. It's in the articles. That came closest. That would have been the preferred one over the others.
Q Okay. Was further testing done on that analog, whatever its proper name was?
A I believe so.
Q Was that testing done while you were at Philip Morris?
A I don't believe so.
Q What kind of testing was done after Dr. De Nobele had finished with his on this
0305
particular nicotine analog?
A It's my understanding that many of these analogs were recharacterized as flavors, and testing only their flavor properties was moved to Europe. And some of the people there tested them for olfactory senses and odors so that they were able to utilize them in products without calling them nicotine analogs.
Q And that is an understanding you came to

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Downloaded from industrydocuments.ucsf.edu/docs/jjxd0001

concerning work that you believe was done after you left Philip Morris?
A It's published. They published some of the papers about the work they did with olfaction and smelling and all of the rest of it. If you look at the compounds while I was at Philip Morris, we made the decision to change the nicotine analog program to a flavor development program so we would take those same compounds and call them flavors and use them in flavors.
Q Okay. Let me make sure I'm being specific here. As part of when it was the nicotine analog program, part of the point was to determine whether these analogs had properties similar to nicotine itself; is that right?
A That's correct.

0306

Q And Dr. De Nobele did the first round of tests and came up with a few and you think one in particular that seemed to mimic the qualities of nicotine?
A That's correct.
Q Was further testing done on those analogs that Dr. De Nobele analyzed to determine their similarity to the properties of nicotine?
A Well, what I am testifying to is that some of the compounds that Dr. De Nobele tested are the same compounds that subsequently show up in 1994 in Dr. Seeman's reports on flavor and odor. So the answer is yes.
Q Are the flavor and odor tested to determine if they have the same properties as nicotine?
A I think so, yes.
Q Okay.
A That is what Dr. Seeman said in the internal reports, that these compounds are the same. We are going to use them in the flavor program, and that way we are going to find out whether they create just like we call nicotine, a flavor.
Q You are saying there is a document from Dr. Seeman that says this?

0307

A I'm saying there is a report from a project that indicates that we are going to use those same compounds in flavor studies that we use in the nicotine analog program.
Q This is all work that was, as far as you know, done well after you left Philip Morris; is that right?
A That decision was before I left. I think it was 1982 or '83. The work was done afterwards as evidenced by publications where these same compounds show up as part of flavors.
Q Okay. Well, let me ask you this, sir: Are you aware of any testing done by the medical college of Virginia concerning nicotine analogs?
A Well, while I was there, some work was done. Subsequent to that, I'm not.
Q Are you aware of the outcome of any testing done by the medical college of Virginia relating to nicotine analogs that Dr. De Nobele felt mimicked the properties of nicotine?

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Downloaded from industrydocuments.ucsf.edu/docs/jjxd0001

A No, I'm not.
MR. LOMBARDI: That's all I have.
MR. FURR: Let's finish these documents up.
FURTHER EXAMINATION
BY DR. FURR:

Q Doctor, take a look at what we've marked as Exhibits 11 through 17, and I'll ask you to verify those are documents you brought with you today.
A Yes.
(Defendants' Exhibits 11 through 17 were marked for identification, the originals of which are attached hereto.)
BY MR. FURR:
Q Let me ask you where you got those documents. And with respect to why you brought them, Schedule A to your deposition notice, tell me what request you thought they were responsive to.
A Okay. Let's see. Basically, I brought all documents that I thought you might not have that might not have been in the two boxes that I produced before.
Q I'll make this shorter. In addition to the R.J. Reynolds documents that are in the two boxes you produced before and the documents that you produced today, are you relying on any other internal R.J. Reynolds documents as a basis for any of the opinions you are prepared to express in this trial?
MR. BROWN: Objection. Overbroad.

THE WITNESS: Probably, yes. The point is I'm not quite sure of the questions, but that is all of the documents that are in the Minnesota and all those websites that I read and I have access to. I did not make copies of all those and bring them.
MR. FURR: That's all I have.
MR. LOMBARDI: Doctor, are you going to want to review and sign your deposition?
THE WITNESS: Yes.
MR. LOMBARDI: Off the record.
///
///

STATE OF CALIFORNIA)
) S.S.
COUNTY OF ORANGE)

I am the witness in the foregoing

http://legacy.library.ucsf.edu/tid/otn05a00/pdf Courtesy of the Legacy Tobacco Documents Library (LTDL) at industrydocuments.ucsf.edu/docs/jjxd0001

deposition. I have read the foregoing deposition and having made such changes and corrections as I desire, I certify that the same is true of my own knowledge, except as to those matters which are therein stated upon my information or belief, and as to those matters, I believe it to be true.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on _____, at _____, California.

_____

WILLIAM A. FARONE, Ph.D.

_

http://legacy.library.ucsf.edu/tid/otn05a00/pdf
Support https://www.industrydocuments.ucsf.edu/docs/jjxd0001